THE AMERICAN ARCHITECT

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THE PARTHENON
From Greek Refinements. By William H. Goodyear, M.A.

The Basis of Beauty

BEAUTY, the principal attribute of the things we most desire, makes a universal appeal. This is especially true within the realm of the fine arts. Any discussion concerning beauty will naturally interest architects owing to the nature of their work and its creative possibilities. They will be most delightfully entertained by reading an article by Mr. W. Carbys Zimmerman, architect, entitled, "The Basis of Beauty," in February issue of *The Atlantic Monthly*. The reading is conducive to further thought and speculations on matters that now claim the attention of architects, possibly more than any other persons whose work involves artistic expression. Mr. Zimmerman's article is written in the form of a discussion between the ancient philosophers, Socrates and Plato, in which he very cleverly explains the underlying principles which should be the basis of our judgment or opinion concerning beauty as a property of architecture.

Plato has been asked to express the regrets of Ictinus and Pheidias that Socrates was unable to attend the festival celebrating the completion of the Parthenon and he voices the opinion of the architects and artists that it is the most beautiful temple in the world. To this opinion Socrates demurs, much to the surprise of Plato, who has accepted the judgment of the architects and artists, and the discussion is under way.

Plato opines that Ictinus must have followed certain rules and laws when he designed his masterpiece and that these laws when applied, would establish as marks of art, all buildings conforming to them. Socrates rejoins by saying that these laws would be found to pertain to good building and that

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architecture is distinct from building. Rules that we will accept will result in good planning and construction. Debating the proposal that a *true* law can govern these features of a good building that appeals to the aesthetic sense, Socrates concludes: "No, Plato, art cannot, in the very nature of things, be subject to laws. If the fine art of architecture were subject to rigid laws it would then be the science of architecture . . . . and all who know these laws would agree without dissent on what is beautiful and what is otherwise." It would naturally follow that all capable of interpreting the law would be of a common mind. This is impossible as all the faculties of perception and reflection are individual and these laws when executed would render different impressions. Even these impressions would not be constant because constancy in opinions held by the same person is not a human attribute.

To digress, beauty cannot be a fixed and determined quality. As defined by Pond, "beauty is the individual's conception of perfection. The fact that standards vary does not alter the principle. Standards of beauty must differ as individuals differ."

Socrates evidently has confidence in the opinion of the man of the street, if he thinks for himself, because it would be what was natural to an unspoiled and unsophisticated taste. Plato contends that the judgment of those who are men of experience, education and culture, should be generally accepted. Socrates argues that "a true law would not be affected by the entire extinction of our race; and even the complete annihilation of our planet would not affect it. Any three stars or points would continue to exemplify Pythagoras' discovery of a law to which we all bow, and which, under all circumstances and conditions, remains eternally true." It does not require deep reflection to appreciate and accept the fact that beauty cannot be subject to a true law as it is a perishable thing subject to the mortality of the individual or his inconstant opinion. Hence the basis of beauty is but the individual opinion. The expression of beauty as it might emanate from all kinds and conditions of men is very entertainingly discussed by Socrates, who concludes by saying that the *"Sum Total of Happiness, the Sum Total of Pain and Pleasure is the same for all mortals."*

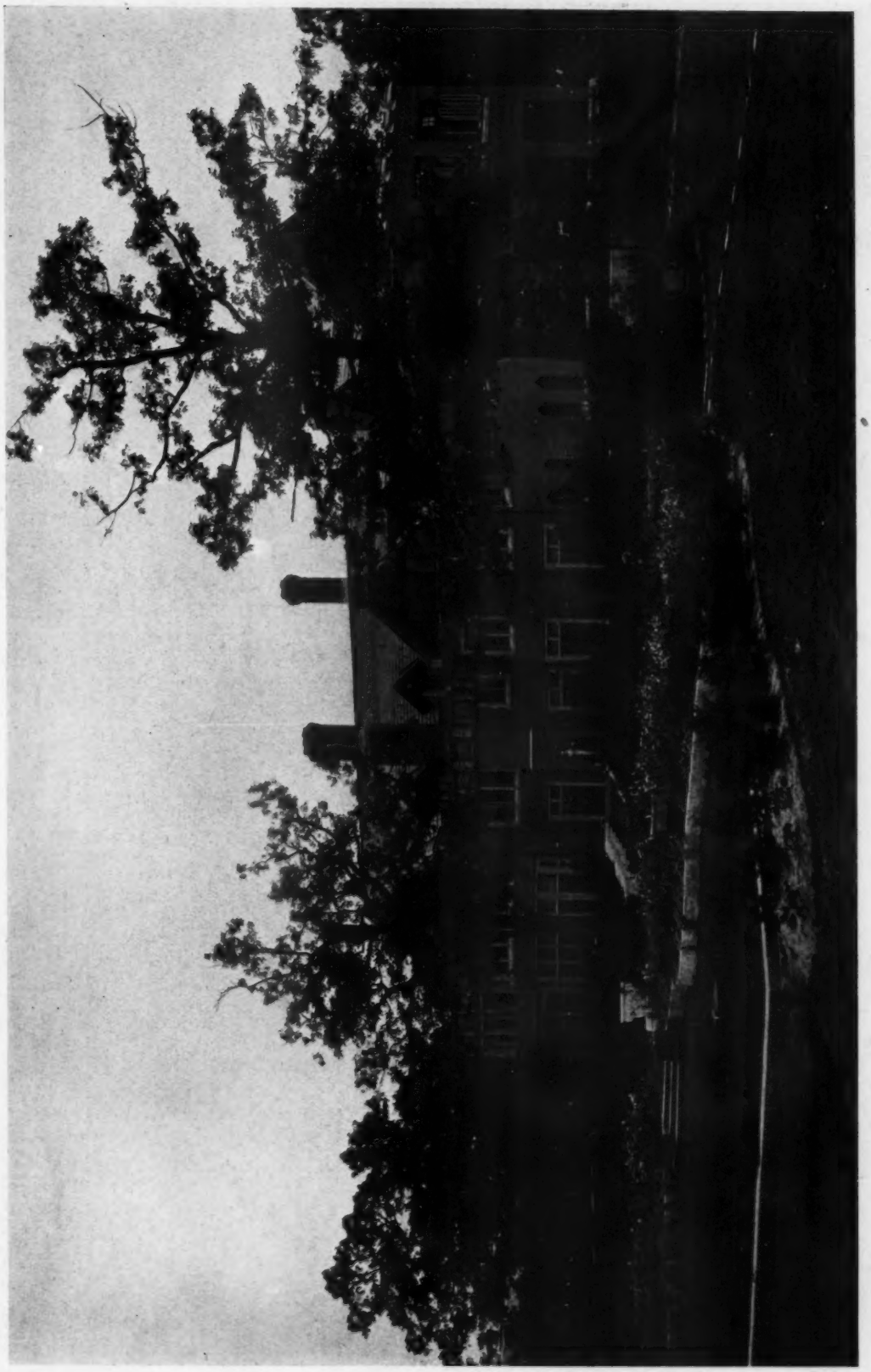
Throughout the entire discussion, Socrates makes an indirect plea for tolerance and a consideration of the opinion of all others, even the man on the street. Intolerance is the characteristic of the intellectually limited man and its practice is always a brake on progress. The teachings of many architectural schools and the clamour of the self-appointed juries of architects and artists have thoroughly inbued the mind of the unthinking public with the idea that any departure from certain standards is unorthodox and it should be taboo. Who can say how many truly beautiful architectural expressions have been lost to the world through the intolerance of groups of architects and those they influence?

It is this influence which recently caused the directors, made up of members of the most progressive profession in the world, to demand that a new building have a typical doric base, columns, entablature and pediment—such as we see anywhere and at any time. A truly beautiful design as submitted was lost to the world and we, who pass on the street, have lost something in the way of an arresting impulse and a mental stimulus that would be welcome.

Referring to another art, Agnes Repplier, in the same magazine, comments on the rather bitter and amusing war between the various schools of poetry and says that "Miss Amy Lowell was right when she said, with her customary insight and decision, that the beliefs and protests and hates of poets all go to prove the deathless vigor of the art. Unenlightened outsiders took up the quarrel with pleasure, finding relief in a dispute that threatened death and disaster to no one." If architecture possesses "deathless vigor" it will be evidenced by the awakening of discussion, by demands that architectural schools desist from training intolerant, single-track students, by an effort to liberalize public opinion and a revival of the creative instinct in the individual.

Our private libraries contain many volumes of all kinds of poetry, a small percentage of which meets with our individual approval. Happily, the balance remains out of sight and mind. Architecture, however, is made manifest in a material structure, ever present to those who see. For that reason a tragedy in architectural expression is deplorable. Assuming that freakish, unbalanced and radical designs are tragedies because they exist unbidden to plague us for long periods of time, could there not be tragedies in a duplication of slavish imitations based on a law, a rule or a style or a school of architecture, thus depriving the world of the inspiration of unborn architectural beauties? The creative spirit is associated with the spirit of adventure and if properly co-ordinated they must develop a beauty that will appeal to large numbers who have an inherent right to enjoy beauty as they may see it.

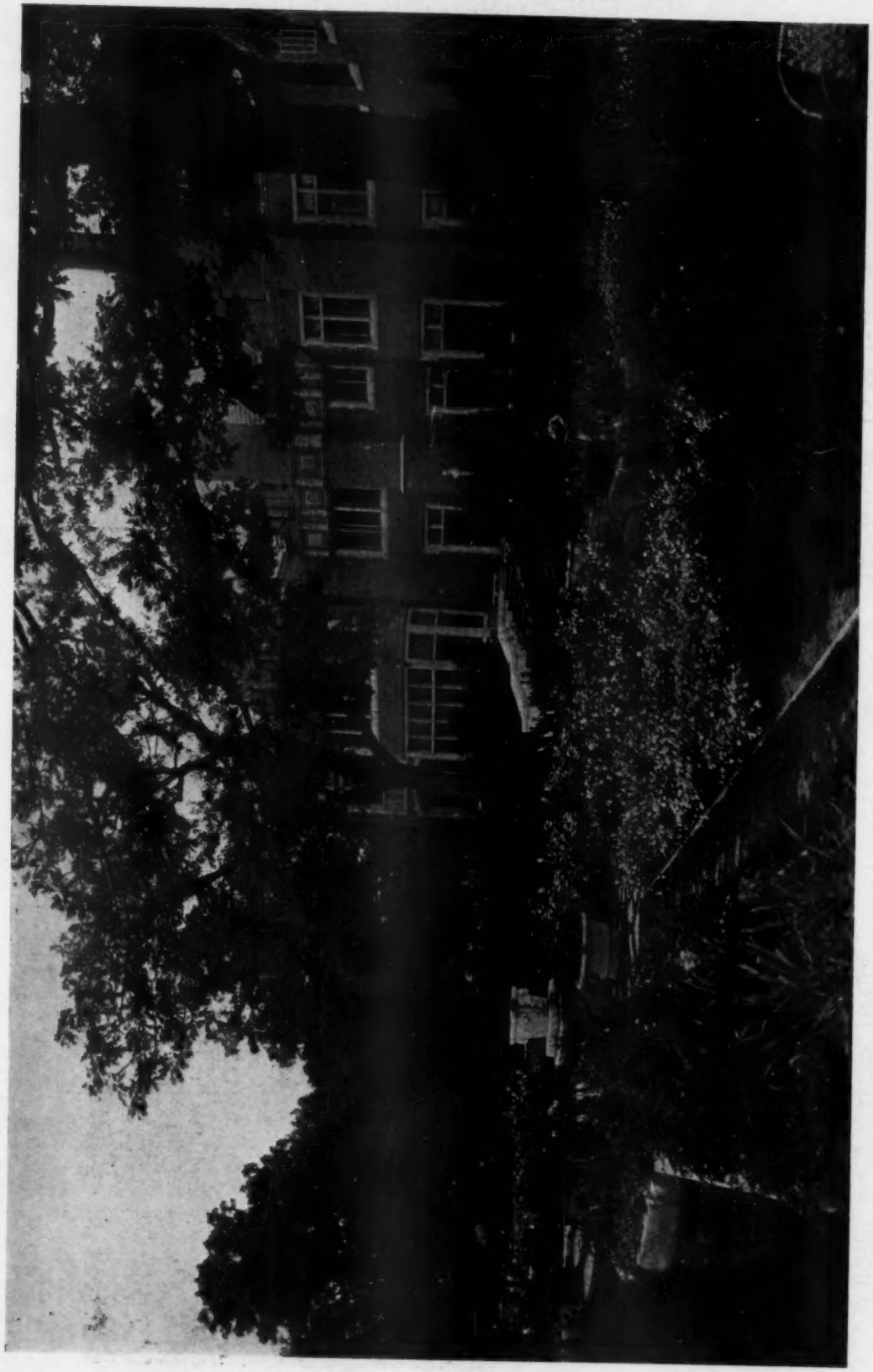
Mr. Zimmerman's article will naturally yield impressions that will be individual and whatever they may be, the consensus will be towards a spirit of tolerance and a questioning of many things as is. It is most timely.



GARDEN FRONT

HOUSE OF ROBERT J. THORNE, LAKE FOREST, ILL.

JOHN W. McKECKNIE, *ARCHITECT*; N. MAX DUNNING, *ASSOCIATE ARCHITECT*



THE GARDEN
HOUSE OF ROBERT J. THORNE, LAKE FOREST, ILL.
JOHN W. McKECKNIE, *ARCHITECT*; N. MAX DUNNING, *ASSOCIATE ARCHITECT*

LIVING HALL
HOUSE OF ROBERT J. THORNE, LAKE FOREST, ILL.
JOHN W. McKECKNIE, *ARCHITECT*; N. MAX DUNNING, *ASSOCIATE ARCHITECT*.

Some Solid Facts on Construction Costs

Where Are Prices Today, and What Is the Real Significance of Lowered Building Construction Costs? Is the Labor Bureau Wrong? How Much Cheaper Can You Build Today Than at the High Level of 1920?

By F. E. Davidson, A.I.A.
President, Illinois Society of Architects

THE clothes the ordinary professional man wears will serve as an illustration of what I shall say here.

Suppose we compare his all-wool suit to the masonry of a building; the shoes, hosiery and underwear to the foundations and frame work; the white shirt to the painting and decorating; the collar and cuffs to hardwood flooring and trim; and the hat to the roofing.

Now assume, for the sake of argument, there being in our problem five factors, that the cost of the suit has been reduced five per cent., the shoes, hosiery and underwear, 10 per cent., the white shirt, 50 per cent., the collar and cuffs, 80 per cent., and the hat, 50 per cent.

What is the correct method of figuring the reduction in price to the man who is to buy, or has bought, those articles?

The Labor Bureau's method of computing the percentage of reduction in this instance consists in adding the total percentage reductions of the individual articles and dividing by the total number of articles. The various percentages total 195 in this particular instance. The Labor Bureau divides that number by 5 (number of factors) and then tells the purchaser of those articles that the percentage of reduction in cost to him was 39 per cent. But is that figure and that conclusion of any value? Not at all.

PROJECT No. 1
Ralph C. Harris, Architect

A three-story English basement 18 apartment building, each apartment consisting of six rooms and three baths. Size of living rooms 18x25 ft., dining rooms 16x20 ft., chambers 14x17 ft. Nothing unusual in the construction and equipment of the building, and medium high grade standard materials were specified.

Low bids received on January 10 are not from the same contractors who submitted low bids May 20, 1920. All estimates, however, were presented by reliable firms

	May 20, 1920	Jan. 10, 1921	Per cent. difference
Masonry	$44,300.00	$40,220.00	9.4
Carpentry	74,000.00	55,700.00	24.7
Concrete	5,200.00	4,650.00	10.5
Stone	5,578.00	6,200.00	7.6
Plumbing	28,100.00	25,870.00	.8
Heating	11,250.00	10,600.00	.6
Electric	4,525.00	4,300.00	.5
Plastering	22,200.00	17,400.00	20.5
Steel	4,629.00	4,209.00	11.2
Sheet Metal	2,890.00	2,960.00	.17
Painting	14,920.00	12,300.00	17.6
Glass	2,113.00	2,200.00	4.6
Tile	5,843.00	5,700.00	2.4
Totals	$225,548.00	$192,229.00	14.75%*

*Average decrease.

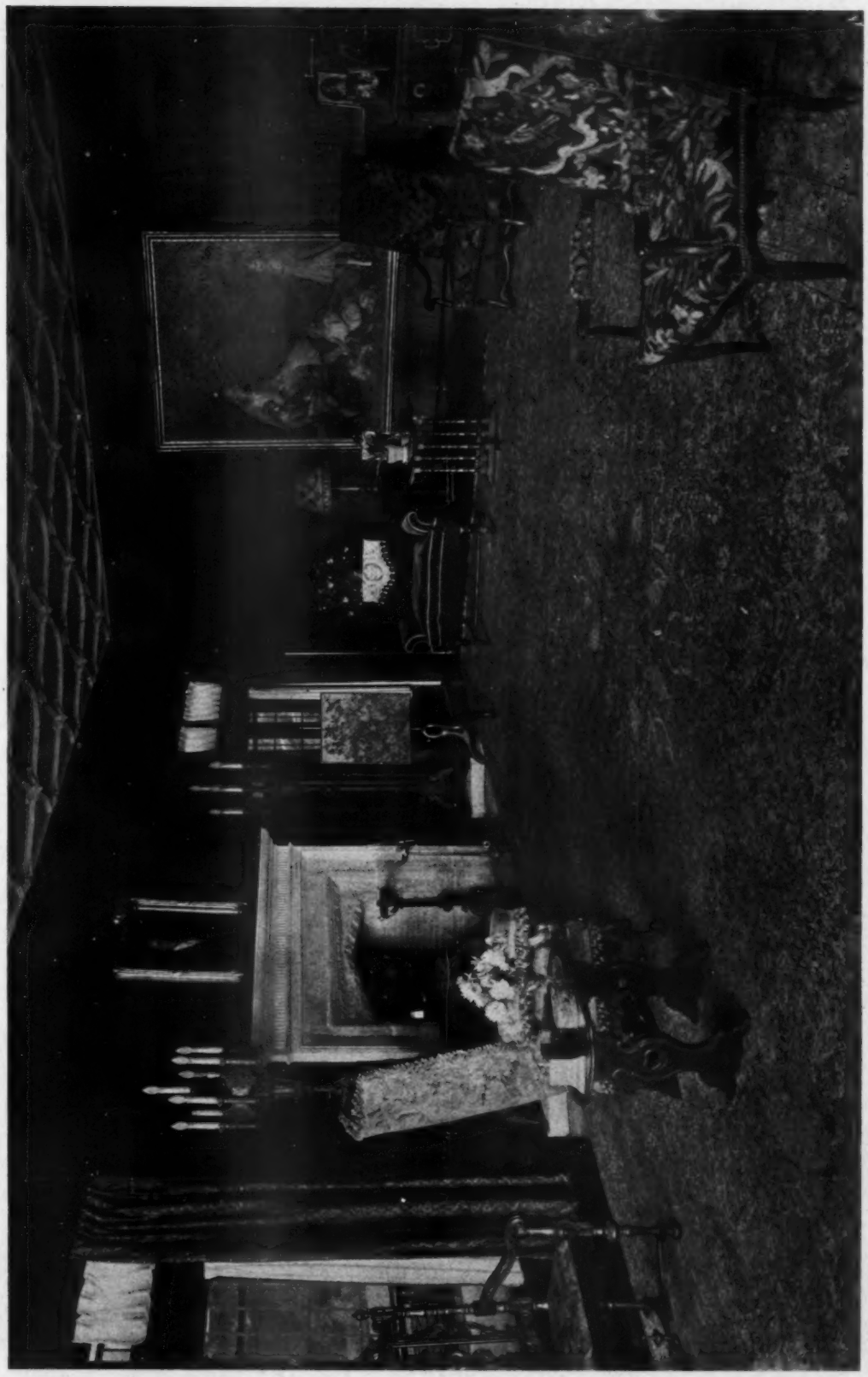
Mr. Davidson recently obtained some figures from architects, who submitted bids on the same projects in the "peak" period of 1920 (construction of which was held up) and after January 1, 1921.

These, and figures for Project No. 2, show the differences in prices of all materials used in the construction of these buildings.

Both tables also show just what Mr. Davidson means by "average reduction in the total of all materials actually used in the construction of a building."

WHAT INTERESTS THE PURCHASER?

The building public, for example, is not interested in how much mahogany trim or oak flooring have been reduced recently. It is interested in the average reduction in the total of all materials actually used in the construction of a building. Suppose that the cost for the lumber for mahogany trim has been reduced 200 per cent., the cost of hardwood flooring 150 per cent., and the cost of all structural timber, 40 per cent. What does this amount to when the cost of the structure is considered? The amount of mahogany trim used is so small that it would probably not amount to 1/10 of 1 per cent. of the total cost of the structure (even if mahogany trim is used). The cost of hardwood flooring in any building would probably not amount to 1 per cent. of the total cost of the structure, and when it is remembered that the total cost of all timber and lumber, even in a standard mill building, only amounts to about 10 per cent. of the total cost of the structure, it will be obvious that large reductions in a few



LIVING ROOM
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items will not materially affect the final figures. I feel that what the American building public should be taught through such journals as THE AMERICAN ARCHITECT is what the percentage in reduction in the complete structure amounts to, and not have so much emphasis mistakenly placed on the very large reductions which have been made in certain specific items, the cost of which, when considered with the total cost of any structure, is very small.

Everyone interested in the building industry must know that building costs are lower than they were at the peak during the year of 1920.

So many erroneous statements, however, have recently appeared in the public press as to the amount of these decreases that so evidently have been based on either incomplete data or have been issued in an attempt to create a false impression of the actual situation that it appears to be opportune that those interested in building construction should be advised as to approximately how much cheaper buildings may be constructed today than at the high level of 1920.

THE CORRECT METHOD

Predictions to the effect that by May 1 next, "the 1914 price levels for building costs will be reached," are so absurd as to justify the serious questioning of the sanity of any man making such a prediction. Nevertheless, at present, the building public is waiting and hoping for lower prices, and, like a small boy passing a graveyard at night, are whistling to keep up their courage. But whistling will not bring down price levels nor will it construct any buildings.

At a recent meeting of the Illinois Society of Architects I requested data on this matter. I asked that any architect present who had taken competitive bids since January 1 on any project upon which competitive bids had been taken during the middle of 1920, but the construction of which had been postponed, prepare a table showing the percentage of increase or decrease of each item and a brief description of the project. The tables printed herewith illustrate what I look upon as the correct way to figure lowered construction costs.

More Figures on "Average Reduction"

PROJECT No. 2

Davidson & Weiss, Architects

A small manufacturing plant located on a switch track of the Belt Railroad in Chicago. Plant composed of a number of one, two and three story standard mill sprinklered buildings, including a separate power house. Plant designed to secure the most economic construction costs. Figures quoted are by the same contractors in each case.

	July 19, 1920	Jan. 19, 1921	Percentage of increase or decrease
Masonry, Concrete and Carpentry	$281,480.00	$249,740.00	—11.2
Radial Brick Chimney	5,930.00	5,870.00	— 1.0
Water Tube Boilers	14,590.00	14,224.00	— 2.5
Furnaces	3,400.00	3,400.00	— 0.0
Structural Steel and Misc. Iron	32,330.00	25,740.00	—20.4
Steel Sash	21,814.00	24,569.00	+12.12
Fire Escapes	2,872.00	2,738.00	— 4.5
Fire Doors, etc.	6,525.00	6,310.00	— 3.3
Hollow Metal Doors	1,857.00	1,857.00	— 0.0
Sheet Metal Work	5,076.00	4,560.00	—10.16
Glazing	19,920.00	21,980.00	+10.68
Plastering	7,715.00	7,715.00	— 0.0
Cut Stone	1,360.00	1,250.00	— 8.09
Elevators	5,200.00	4,500.00	—13.46
Roofing	16,570.00	16,400.00	— 1.02
Tile Flooring	102.00	92.00	— 9.8
Painting	13,763.00	12,662.00	— 8.0
Heating	70,000.00	61,000.00	—12.8
Pipe Covering	5,062.00	4,556.00	—10.0
Electric Wiring	24,336.00	21,006.00	—13.6
Sprinkler Equipment	34,956.00	32.115.00	— 8.1
Gravity Tank	7,075.00	6,297.00	—10.9
Plumbing and Drainage	20,290.00	19,276.00	— 4.99
Fire Pump	3,125.00	3,425.00	+ 9.63
Totals	$605,348.00	$551,282.00	— 8.931

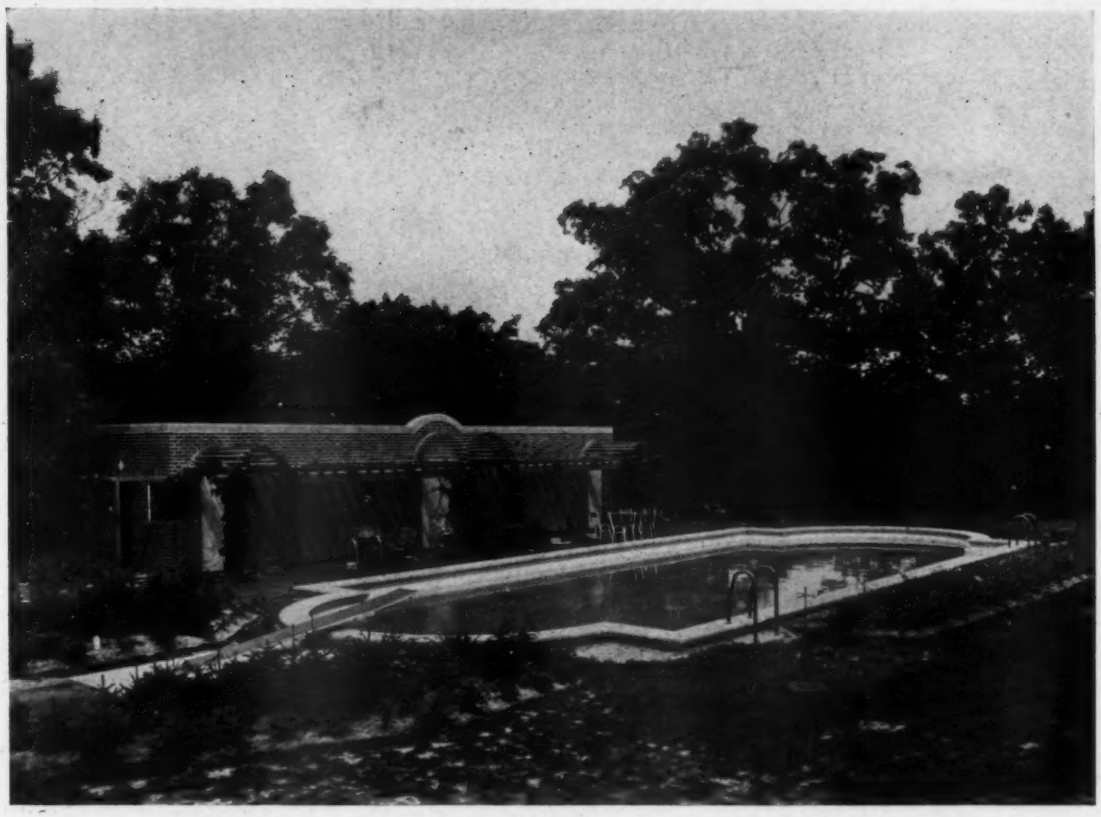
What would a substantial reduction in the Glazing have meant in Project No. 2? The figure was $19,920. Suppose there had been one of the "striking reductions" in the price of Glazing; and suppose it had cost the cost of the Glazing in this project $1,000. What is the ratio of $1,000 to $605,348? What does it amount to after all, in the *total result?* There you have my point. $1,000 *is* $1,000, I grant you; but $1,000 is a rather insignificant item in a total cost of $605,348.

It is, of course, obvious to every student of the situation that, until labor costs are lowered and until freight rates are reduced, building costs cannot and will not be materially lower than they are at the present time.

WHAT EVERY ARCHITECT **MUST** DO

As I have repeatedly predicted, the average price level of building material costs will follow in general the price level of all commodities, and the price level of commodities will parallel the curve representing monetary circulation, as well as loans and discounts. The American public must become accustomed to doing business on a higher price level than before the war.

What every student of economics should do, what every architect *must* do, is to teach the public some of the fundamentals of economic laws and assist in



SWIMMING POOL, SHOWER BATHS AND DRESSING ROOMS

GATE LODGE

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promoting the economic truth that the best interests of our nation at this time will not be subserved by the wiping out of any portion of our circulating medium, or in making any material reduction in the volume of credits, but in the stabilizing of conditions. As soon as those interested in building construction have been convinced that costs are more or less stabilized, construction work will start and all of the conventions or conferences that may be held will not change this economic fact.

Let us therefore face conditions as they are and so shape our course as to be in accord with economic laws which cannot be amended by any resolution of any convention, nor be repealed by any act of legislatures.

Rome Extending Her Area

Ancient City Reclaims Campagna for Ampler Food Supply and More Room for Her People

Through the reclamation of the Campagna Romana, the vast tracts of land which for centuries have lain fallow and neglected for miles around Rome are to be the scenes of new life and hope. That this land should be restored to productiveness has long been the dream of Italian economists and that it is being realized in a surprising degree of progress is now borne out by official reports.

The Campagna to the modern world is a land of marshes and malaria, dotted here and there with remains of ancient Rome and cut by the still existent chariot roads that led from the imperial city to the provinces of the empire. The only habitations are the huts of the herdsmen who watch the half wild cattle, for the peasants who work small and more favorably situated tracts make their homes high on neighboring hilltops. From May to the end of the year the few people remaining on the Campagna lead a miserable fever stricken existence. William D. Howells has told us of its charms for the antiquarian researches, Henry James in his "Daisy Miller" of the perils of its miasmatic night air and Dumas and other novelists have peopled it with bold, daring brigands, though in reality even the husky bandits of romance could not survive in its malarial marshes.

Against this untoward condition is set the conditions of the Campagna of the Roman Empire as described by ancient writers. Then it was a densely populated, prosperous district with a perfect system of drainage and more healthful than Rome itself. The present most desolate section of the Campagna, the strip from Monti Albani to the sea, was the home of the ancient Romans who won their supremacy over their neighbors and ruled the then known world. The decline came when the small farms gave way to the large landed estates.

Many of the great Popes tried in vain to reclaim this land. A law recently passed decreeing that land not cultivated to its utmost capacity is liable to confiscation was the real turning point. The owners of some of the largest estates undertook their cultivation. The results were beyond their greatest expectation; the land, which seems to have stored up the fertility of centuries, yielded immense returns on the labor. Hundreds of acres on other estates have been reported drained, plans made for irrigation and modern farm machinery installed. These efforts are believed to be the beginning of a restoration which will eventually include all the arable tracts of the Campagna. In this transformation the ancient city sees a new hope for the supplying of her two greatest needs, a nearer and cheaper source of food and a chance for the long demanded extension of her present limits.

Model City for China

Young Native Plans to Build Chinese-American Town on His Estate

S. Won-Kingsing, a young Chinese graduate of the University of Minnesota, is planning the building of a model city to be called Gee Len, in the province of Kwang Tung, China. Won-Kingsing, who is but 25 years of age, has been in the United States for the past five years, and after graduating in an academic course, has devoted his time to the study of living conditions and education of his race. His father died recently leaving him 700 square miles of heavily timbered land, and it is on this that he plans his Chinese-American city, which will be a model in many ways for many others to be constructed later throughout China. Some of the fundamentals of the first known apartment house, which is in China, will be incorporated in the modern ideas of the American architects.

In his project, Won-Kingsing has the co-operation of many leading Chinese educators and business and Government officials both here and at home. He has been through the big tract of land on hunting trips. It is now unsettled, as it is a dense forest of hardwood, akin to teakwood. There is enough lumber available, he says, to support the little model colony right from the start, while as the land is cleared it will be very suitable for sugar planting and the raising of other valuable commodities.

All that is best in American home construction that can be combined with Chinese conditions, school buildings, hospitals, churches, Chamber of Commerce, wireless stations, etc., will be built, he says.

LIBRARY

DINING ROOM

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Old Dutch Farm House, Staten Island

(See Reproduction of Original Drawing by O. R. Eggers on Opposite Page)

The sturdy qualities of the Dutch who settled Manhattan Island and spread out across the Hudson to New Jersey and seaward toward Staten Island are well typified in the house selected by Mr. Eggers for the present illustration. Low in height and broad in expanse, this colonial farm house solidly sits its site. One may imagine the stolid burgher taking his ease on the wide spreading porch, sheltered from the oppressive heat of the summer sun, or during inclement days in winter equally snug and comfortable before the stone fireplace of the low beamed kitchen ceiling.

Few of these oldtime farm houses remain, and when he who tramps the unfrequented highway comes upon one, the charm of its picturesqueness is appealing.

The wide clapboarded walls and the adze-hewn shingles have taken on the most wonderful colors, the effects of many years of aging. In some instances these old houses are embowered by climbing vines whose sturdy trunks indicate the many years of their growth.

OLD DUTCH FARM HOUSE, STATEN ISLAND, N. Y.
THE AMERICAN ARCHITECT Series of Early American Architecture

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EDITORIAL

A Plain Duty

ATTENTION has been directed to the well conducted propaganda by building contractors in the education of the public as to the necessity for speedy preparation to meet what is universally believed will be a pronounced building activity in the early Spring.

There are no good reasons why architects should submit to a monopoly in this valuable work. In fact, as the master builders, they should be the first to promote public confidence. There are no ethical obstacles to such a course. Architects may advertise. They cannot find a better or more dignified method of placing themselves before the public than by publishing over their signatures such carefully prepared and accurate statements as will tend to give the public the same confidence as to the future of building as every well informed architect will feel.

Why let the building contractors monopolize this desirable field?

A New Civic Center in New York

THE man on the street who has intimately known New York as man and boy for fifty years will find in the present rapid development of the Columbus Circle section much to make him reminiscent.

He will have seen the civic center start at Fourteenth Street, slowly move to Twenty-third Street, then jump to Forty-second where for the last fifteen years it has stopped. The buildings now in progress of erection or contemplated will create at the southeastern corner of Central Park an area of skyscrapers that will rival even that cluster whose magnitude calls forth the most enthusiastic remarks from the foreign visitor who approaches Manhattan Island from the sea.

The United States Rubber Building, the first of the tall buildings in the Columbus Circle section, built some six years ago, reared its twenty stories alone until within six months. Since then there has been built the twenty-four-story building for the Gotham National Bank, there is nearing completion the equally tall building of the Fisk Tire Co. The Hearst building, now a preliminary structure of but two stories, will, it is rumored, be built up to its originally projected height of perhaps the tallest structure in the world.

Further, there is the announcement that on the block bounded by Fifty-seventh and Fifty-eighth Streets, Broadway and Eighth Avenue, now occupied by the Thoroughfare building, another twenty-four story building to be called the Colonnade will be erected.

Due to the wise restrictions of zoning regulations, all of these buildings with the exception of the United States Rubber Building, erected before the zoning law was passed, will be "set back" buildings, of the best architectural treatment. Now that there has been started a well developed plan for the creation of a civic center, it is to be hoped that in the erection of future structures the architectural resources may be carefully conserved and that New York will have a civic center which it may properly point to with pride.

Daylight Saving

THE action of the New York State legislature in repealing the daylight saving bill is not meeting with approval. Mr. William Fellows Morgan, president of the Merchants' Association of New York, has been outspoken in condemning the repeal of this measure. The consensus of opinion is that it is the result of petty politics and directly against the express wishes of the voters.

The poll taken by the Merchants' Association shows that 230,000 of the 241,000 workers in New York City favor daylight saving, and this overwhelming vote undoubtedly represents the sentiment all over the State. The issue as joined appears to be one as between the farmers and the workers in large cities. As the case stands, the matter will very seriously affect building in all of the large cities in this State.

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Beaux-Arts Institute of Design

DIRECTOR OF THE INSTITUTE, LLOYD WARREN

ARCHITECTURE, RAYMOND M. HOOD
SCULPTURE, JOHN GREGORY

INTERIOR DECORATION, ERNEST F. TYLER
MURAL PAINTING, ERNEST C. PEIXOTTO

Official Notification of Awards—Judgment of November 16, 1920

PROGRAM

CLASS "A"—I PROJET.

The Committee on Architecture proposes as subject of this Competition:

"A COUNTRY HOUSE."

A successful and travelled American of hospitable nature finds on account of his increasing family that his early home is inadequate, and no longer attractive, due to business encroachments. He has, therefore, purchased a farm which he intends to develop into a country home for occupation during the entire year, except for a few months in midwinter, and even then during the holidays the house will be opened.

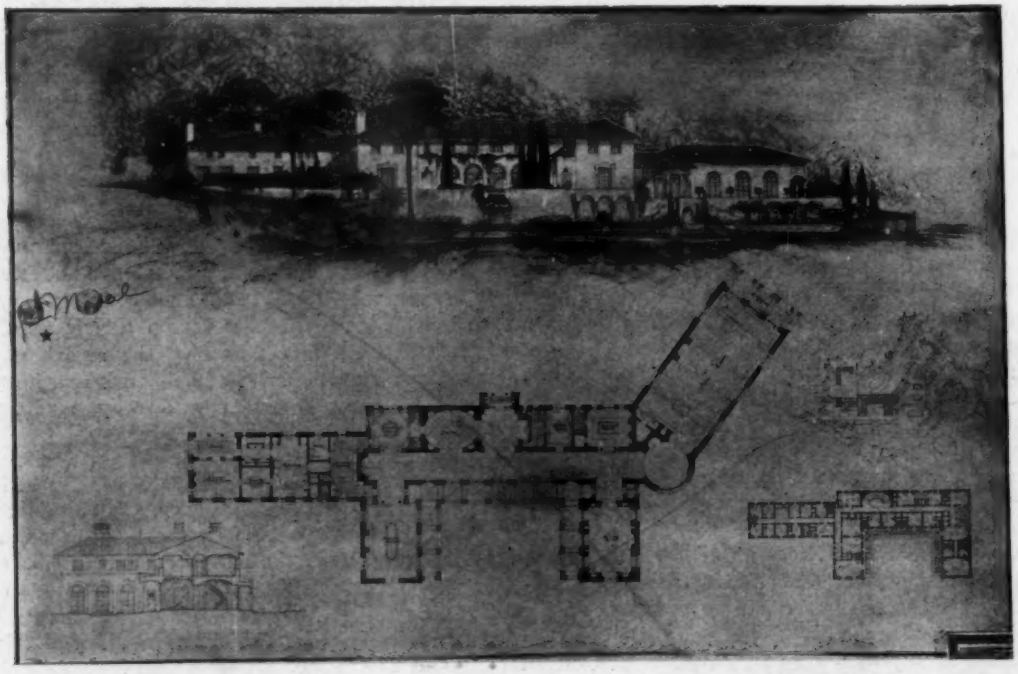
Together with a natural love of outdoor life and sports, both the owner and his family have a keen and varied interest in music and the arts, and their house and its surroundings should be developed accordingly. In particular, attention needs to be given to the proper accommodation, privacy and entertainment of the servants, for being at a distance from the attractions of the town, this is necessary in order to make the place desirable and to retain those of the better class.

The farm is situated in a wooded, hilly country and is traversed by a small river, whose upper reaches are well above the level of the area of development so that there is an ample water supply for all necessary purposes, including even a reasonable amount for use in the gardens.

The house is to be built on a sloping hillside, which rises to a great height north of the house, but falls away to the south, east and west, giving a splendid view in these directions. Approximately three (3) acres, or one hundred and thirty thousand (130,000) square feet of land are available for the development in direct connection with the house.

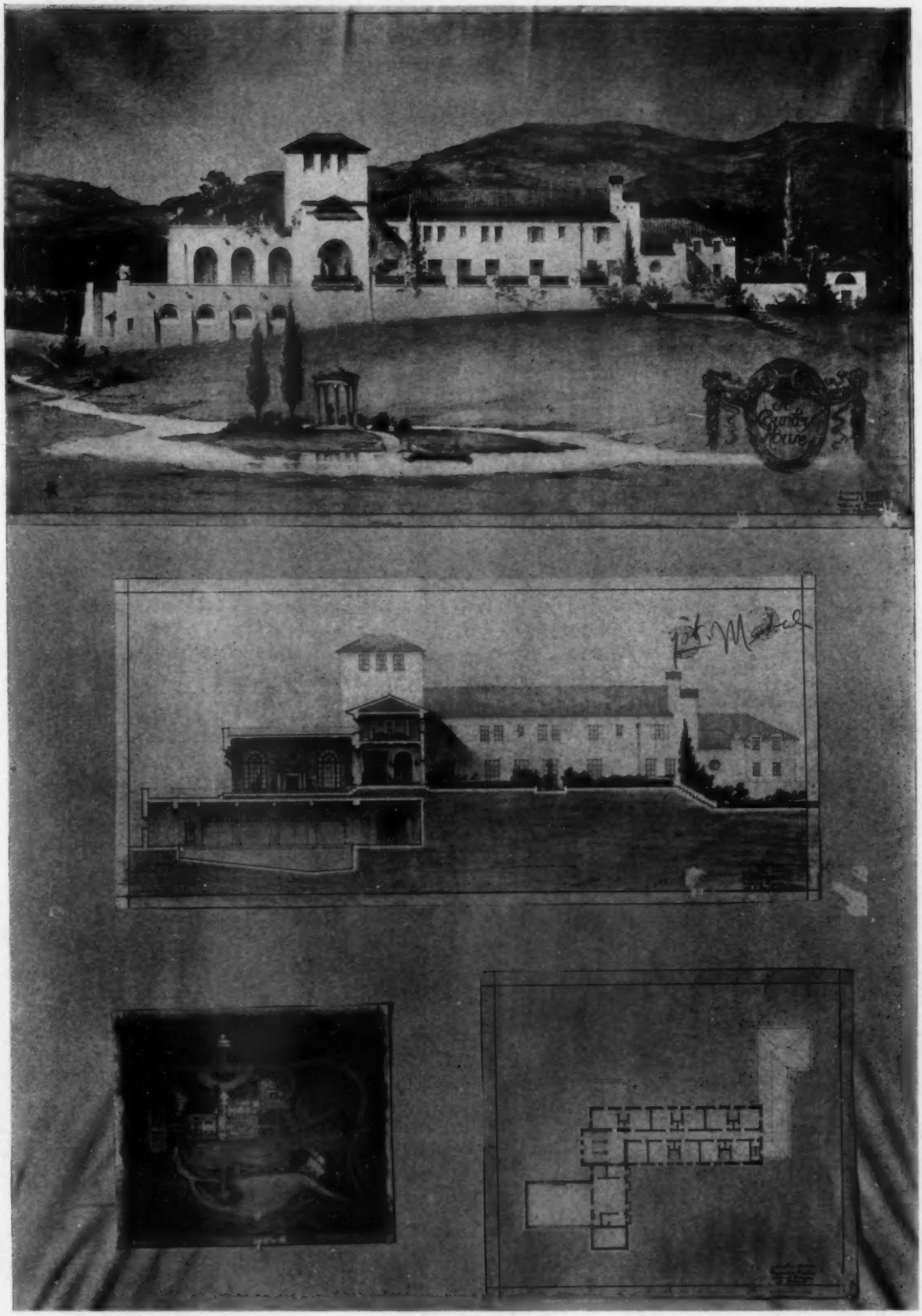
The problem requires the arrangement of the residence and grounds in a manner suitable to the circumstances of the family as before indicated, but does not include the farm development, garage, stables, service buildings, etc., which are outside of the limits of the area described above.

The house should be airy and cheerful and should provide for about twelve (12) masters' bedrooms, which may be on upper floors, and ample accommodations for service. Besides the other usual features of such a large house, the owner wishes to have a great hall or music room which, in conjunction with the other principal rooms, forms an ensemble suitable for entertaining on a lavish scale, and also a swimming pool.



1st MEDAL F. K. DRAZ, CARNEGIE INSTITUTE OF TECHNOLOGY

CLASS "A"-1 PROJET—A COUNTRY HOUSE



1st MEDAL R. A. FISHER, UNIVERSITY OF PENNSYLVANIA

CLASS "A"-1 PROJET—A COUNTRY HOUSE

STUDENT WORK—BEAUX-ARTS INSTITUTE OF DESIGN

This latter feature may be in a detached pavilion in the gardens surrounding the house, or in a part of the house.

JURY OF AWARD:

R. M. Hood, L. Warren, H. R. Sedgwick, B. W. Morris, E. V. Meeks, H. Hornbostel, J. M. Howells, H. W. Corbett, P. P. Cret and S. Walker.

NUMBER OF DRAWINGS SUBMITTED: 85

AWARDS:

First Medal: F. K. Draz and H. T. Aspinwall, Carnegie Inst. of Tech., Pitts.; R. H. Bickel, Columbia Univ., N. Y. C.; R. Nickel, "T" Square Club, Phila.; R. A. Fisher, R. F. Larson and R. S. Potter, Univ. of Pennsylvania, Phila.; R. B. Thomas, Yale Univ.-Sch. of Fine Arts, New Haven.

Second Medal: L. J. Rockwell, B. Dierks and C. W. Hunt, Carnegie Inst. of Tech., Pitts.; G. W. Trofast-Gillette, Columbia Univ., N. Y. C.; T. M. Hofmeester, Jr., Chic. Sch. of Archt.-Dept. of Archt. of Armour Inst. of Tech., Chic.; E. C. K. Schmidt and H. R. Leicht, "T" Square Club, Phila.; D. R. Cochran, G. K. Trautwein, L. H. Pries, E. O. John, K. A. McGrew, G. K. Geerlings and S. J. Laschenski, Univ. of Pennsylvania, Phila.; P. Jensen, Atelier Wynkoop, N. Y. C.

Mention: H. A. Wieland, R. E. Dake, N. D. Kutchukian, C. LeRoy DePrefontaine, L. S. Lashmit, H. W. Smith, R. M. Crosby, P. F. Simpson, E. A. Earley, S. H. Jamison, R. Schmertz, W. Perkins and M. Pohlmeyer, Carnegie Inst. of Tech., Pitts.; M. L. Colean, S. M. Clement, C. H. Sherwood, Y. Kasin, E. W. Burkhardt, D. R. Everson, F. W. Brown, J. G. Schuhmann, Jr., A. W. Bitterman, R. S. Buck, Jr., R. W. Craton, B. E. Irby and L. G. Noyes, Columbia Univ., N. Y. C.; I. L. Loehl, Helen L. Fassett, G. D. Conner, N. J. Schlossman, R. J. Nedved, M. F. Winiarski, and A. J. Schoening, Chic. Sch. of Archt.-Dept. of Archt. of Armour Inst. of Tech., Chic.; R. DeGhetto and M. Jaeger, Jr., Atelier Hirons, N. Y. C.; R. L. Conn, Atelier Corbett-Gugler, N. Y. C.; R. L. Goldberg, R. Platt, A. Westover, Jr., and H. S. Atkinson, "T" Square Club, Phila.; G. W. Green and S. J. Laschenski, Univ. of Pennsylvania, Phila.; L. F. Soxman and W. M. Icenhower, Univ. of Kansas, Lawrence; T. F. Price, R. Banwell and E. F. Cullity, Atelier Wynkoop, N. Y. C.; L. Hamilton, Yale Univ.-Sch. of Fine Arts, New Haven.

H. C.: A. M. Browde, W. C. Sponholz, F. M. Baldwin and R. L. Minkus, Chic. Sch. of Archt.-Dept of Archt. of Armour Inst. of Tech., Chic.; W. S. Boice, Atelier Hirons, N. Y. C.; G. A. Barry, Univ. of Pennsylvania, Phila.

1st MENTION—C. B. MARKS, CARNEGIE INSTITUTE

CLASS "B"-1—ESQUISSE-ESQUISSE

A STONE TEA HOUSE IN A PRIVATE PARK

CLASS "A"—I ESQUISSE-ESQUISSE

The Committee on Architecture proposes as subject of this Competition:

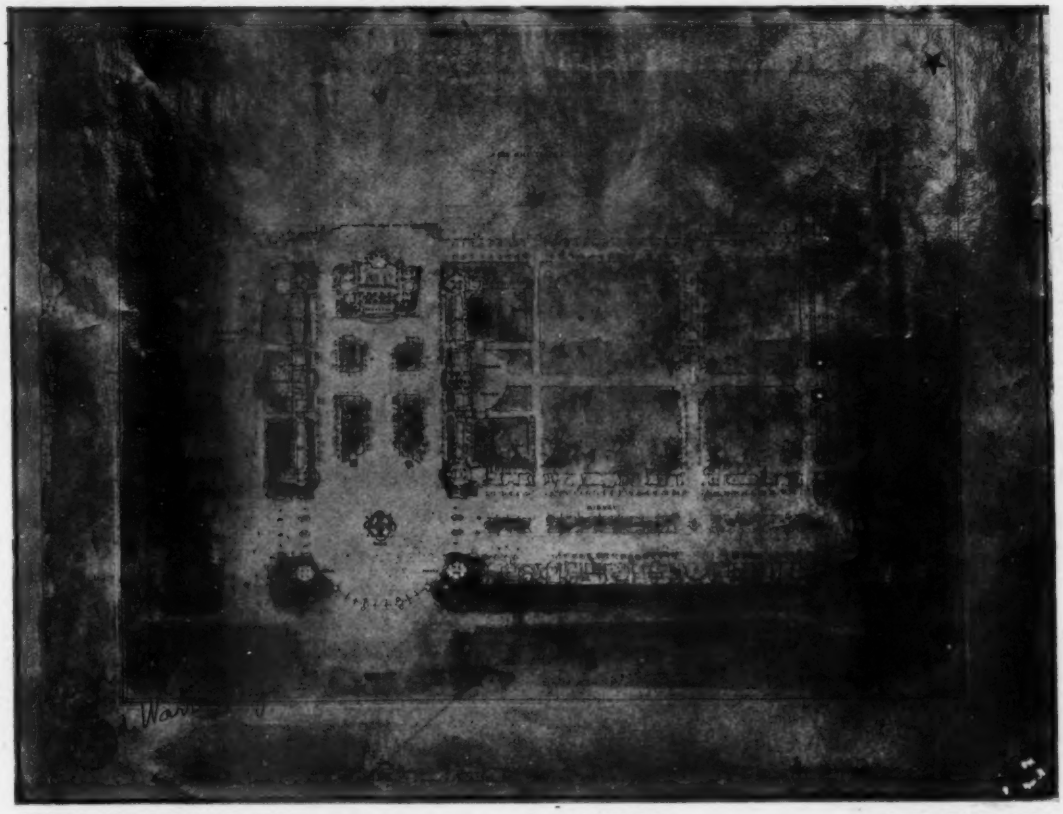
"A GROUP OF BUILDINGS FOR A BOYS' BOARDING SCHOOL."

A successful design for a group plan of this kind is a happy compromise between conflicting conditions and desires. The buildings or units should be separated enough so as to have plenty of air and light for each, and at the same time they should have easy and close communication. There should be a certain internal privacy for the school life, giving freedom from the noise and distraction of the public streets, but there must be no feeling of an asylum. While the arrangement should be orderly, it should partake rather of a domestic than of a formal character.

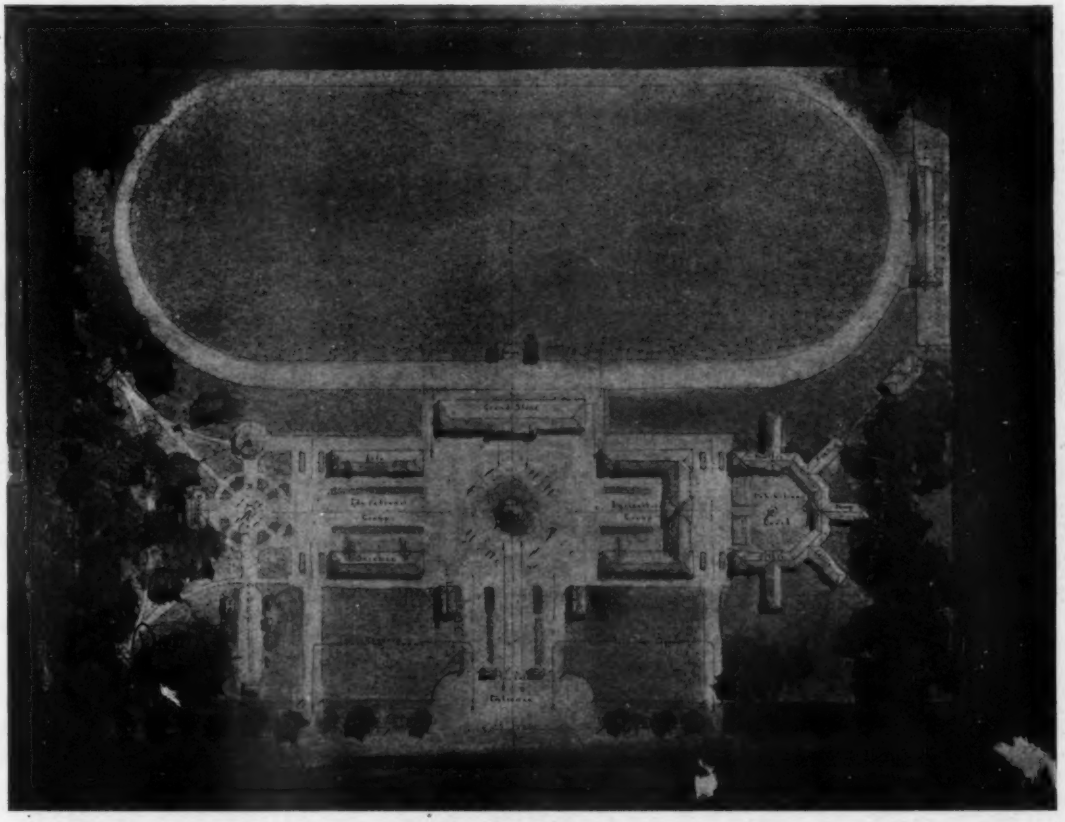
The site is a level rectangular plot bounded by four attractively shaded streets on the outskirts of a large city in the middle west. Its dimensions are 320 feet east and west and 640 feet north and south. The main street and natural approach is along the south side of the plot. The athletic field of the school is on the opposite side of the street, east of the school site. The school is limited to 300 pupils, who will live inside the group and no day scholars are contemplated. It is not a secular school, so the chapel need not dominate the composition.

The following requirements shall be arranged either in separate or attached units, as desired:

The Main School (including Administration, Library, Study Hall and Class Rooms). This may be disposed on two or three floors.



SECOND PRIZE—PLACED THIRD E. L. HOWARD, NEW YORK CITY



FIRST PRIZE V. S. SWAN, CORNELL UNIVERSITY

WARREN PRIZE COMPETITION—A COUNTY FAIR

STUDENT WORK—BEAUX-ARTS INSTITUTE OF DESIGN

The Headmaster's House with a garden adjoining.
A Chapel to seat 400.
Dormitories with apartments for four married masters, so placed as to properly control the students. These dormitories may be on two or three floors.
A Dining Hall (to seat 350) with kitchen and other necessary services.
A Large Gymnasium (including a swimming pool).
A Power House and Laundry.

JURY OF AWARD:

W. F. Lamb, J. O. Post, P. A. Cusachs, H. Greenley, F. C. Hirons, L. F. Peck, J. Wynkoop and E. H Denby.

NOTE:

This Jury also served as Jury of Award for the Class.
Class "B"—I Esquisse-Esquisse, and Class "A" and "B" Archaeology—I Projet.

NUMBER OF DRAWINGS SUBMITTED: 31

AWARDS:

Third Medal: T. E. Ash, "T" Square Club, Phila.; R. F. Larson, Univ. of Pennsylvania, Phila.
Mention: G. Fraser, Cornell Univ., Ithaca; G. K. Geerlings, Univ. of Pennsylvania, Phila.

PROGRAM

CLASS "B"—I ESQUISSE-ESQUISSE

The Committee on Architecture proposes as subject of this Competition:

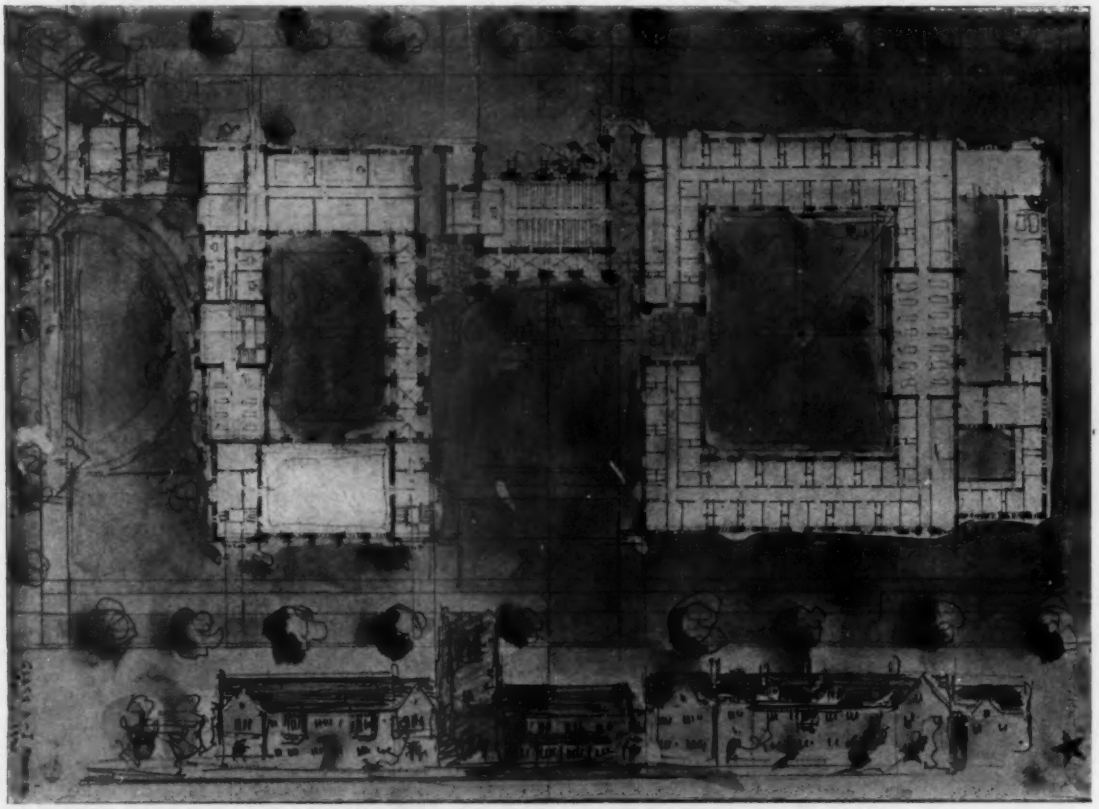
"A STONE TEA HOUSE IN A PRIVATE PARK."

The gardens of a large estate consist, beside the usual formal grounds and terraces in close proximity to the house, of a large tract of picturesque woodland, which, while kept up, has been left largely in its natural form. The owner wishes to erect, in a glade traversed by a small stream, a stone tea house to provide rest and refreshment to those who are walking or driving through his park. He has no determined idea as to the form this tea house should take, except that it should be appropriate to its setting and should provide a small room for the preparation of simple refreshments and for the storage of the necessary service. The greatest dimension of the tea house should not exceed thirty (30) feet.

NUMBER OF DRAWINGS SUBMITTED: 53

AWARDS:

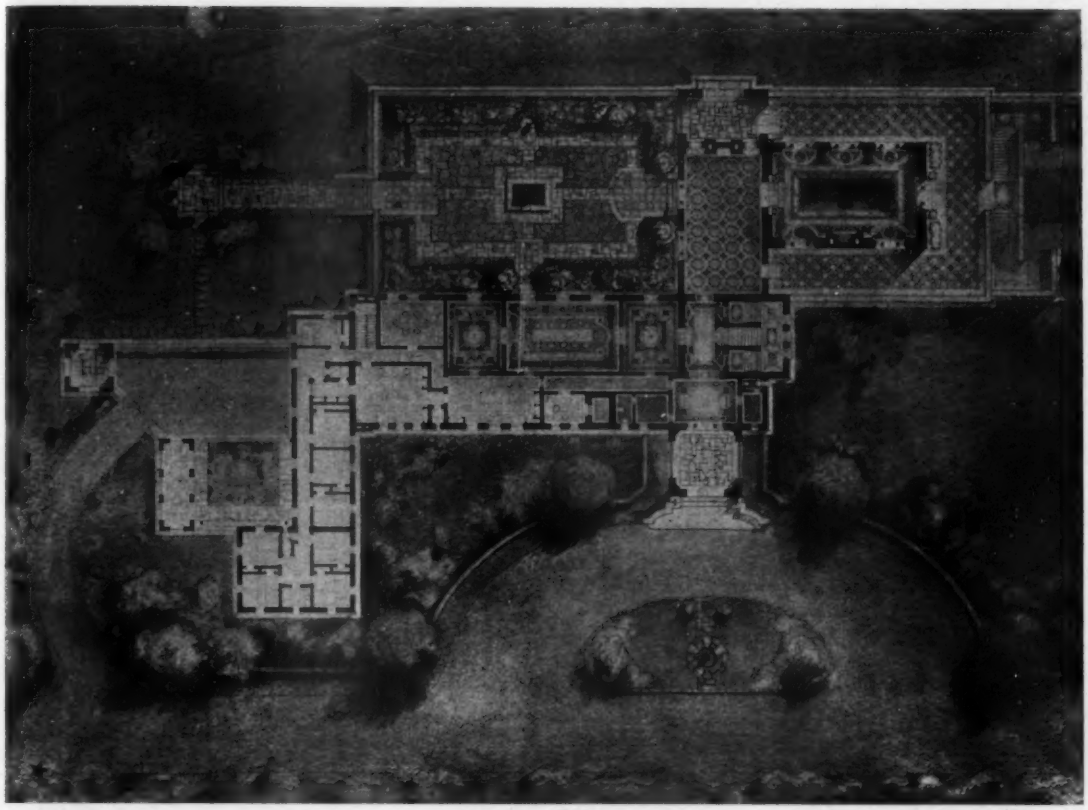
First Mention: C. B. Marks, Carnegie Inst. of Tech., Pitts.; A. Marshall and C. H. Dornbusch,



CLASS "A"-1. ESQUISSE-ESQUISSE

A GROUP OF BUILDINGS FOR A BOYS' BOARDING SCHOOL

3d MEDAL — R. F. LARSON, — UNIVERSITY OF PENNSYLVANIA



1st MEDAL R. A. FISHER, UNIVERSITY OF PENNSYLVANIA

CLASS "A"-1 PROJET—A COUNTRY HOUSE

Columbia Univ., N. Y. C.; G. A. Hacker, Atelier Sibley, Palisade; H. S. Kelly, Yale Univ.-Sch. of Fine Arts, New Haven.

Mention: M. E. Witmer, Boston A. C., Boston; H. B. Tross, Buffalo A. C., Buffalo; J. W. Minick and S. Jamison, Carnegie Inst. of Tech., Pitts.

CLASS "A" AND "B" ARCHAELOGY—I PROJET.

The Committee on Architecture proposes as subject of this Competition:

"THE FORECOURT OF AN EGYPTIAN TEMPLE."

Religious fervor and reverence for the dead are the most important characteristics of the ancient Egyptians which found expression in the architecture of the Nile Valley. Their temples, built for all time, were not intended for public gatherings, but were the houses of the priests and the places of worship for the kings. In its essential features the plan of the Egyptian temple consisted of a forecourt, a hypostyle hall and the sanctuary with the adjoining priests' rooms—the whole being surrounded by a massive exterior wall. The entrance from the forecourt to the hypostyle hall was usually flanked by huge pylong or colonnades. Here a splendid feeling of grandeur was obtained through the simplicity and solidity of the architecture, the stone surfaces of which were relieved by surface carving and a lavish use of color.

The subject of this competition is the design of the forecourt and the entrance to the hypostyle hall. The extreme width of the forecourt shall not exceed 100 feet. Its length is not limited.

NUMBER OF DRAWINGS SUBMITTED: 4

AWARDS:

Third Medal: M. L. Keller, Columbia Univ., N. Y. C.; H. C. Heath, Univ. of Texas, Austin.

Mention: G. L. Walling, Univ. of Texas, Austin.

THE WARREN PRIZE.

The gift of Messrs. Whitney Warren and Lloyd Warren offered for excellence in planning a group of buildings.

FIRST PRIZE—$50. SECOND PRIZE—$25.

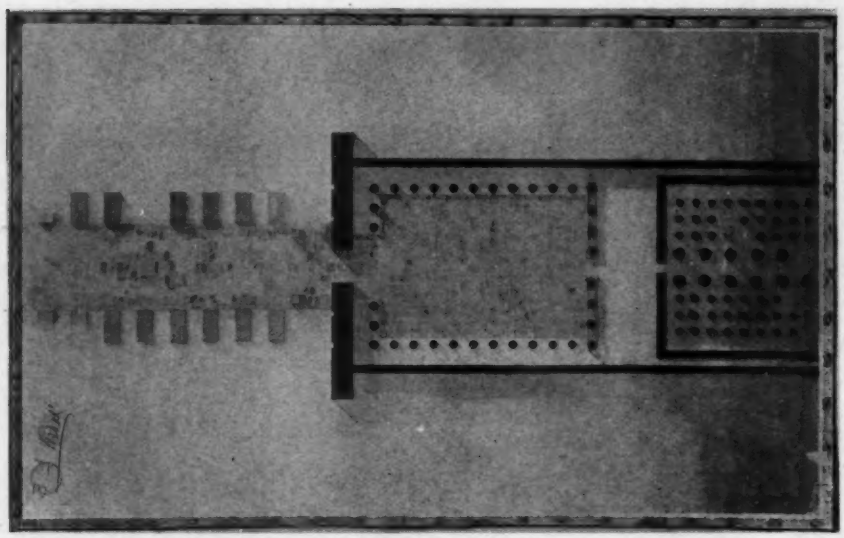
(For conditions governing this Prize Competition see Circular of Information, Article VIII—Par. 1 and 3.)

The Committee on Architecture proposes as subject of this Competition:

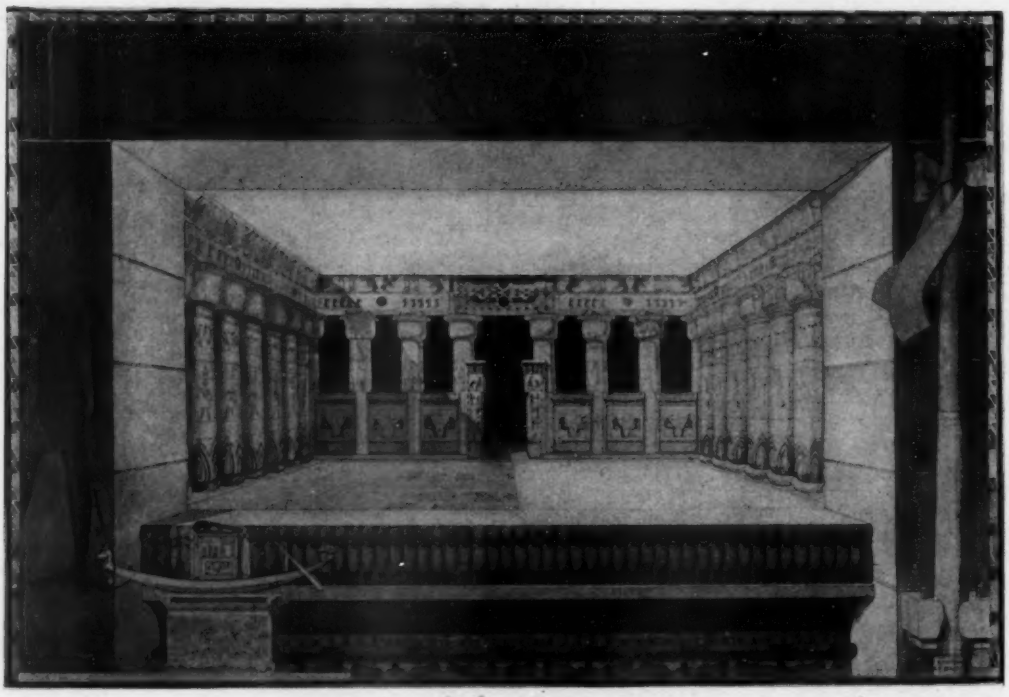
"A COUNTY FAIR."

On the outskirts of a county seat on a tract of land measuring 1,800 by 2,500 feet, the County Fair Association desires to establish its fair grounds, which are to include the following elements:

1. A One Mile Race Track with the necessary grandstands, paddock and stables.
2. The Exhibition Building or Buildings for cattle,



FLOOR PLAN, FORECOURT OF AN EGYPTIAN TEMPLE



3d MEDAL H. C. HEATH, UNIVERSITY OF TEXAS

CLASS "A" AND "B"-ARCHAEOLOGY-1. PROJET

FORECOURT OF AN EGYPTIAN TEMPLE

pigs, poultry and other forms of livestock. In connection with this group, which in general should be so arranged that the various breeds and classes can be exhibited separately, there should be provided an open space for the judging of the animals and the awarding of prizes.

3. The Agricultural Group, which is to provide facilities for the exposition of all sorts of produce.

4. The Educational Exhibit, embracing domestic science, scientific farming, art and other phases of education.

5. The Amusement Group or Midway, in which will be found merry-go-rounds, moving-picture theatres, refreshment booths and all sorts of catch penny devices.

In the study of this plan, the control of large crowds, both on foot and in automobiles, especially at the entrances, should be carefully considered. Parking spaces for autos should be provided within the grounds, and the circulation everywhere should be ample, and, as far as possible, direct and convenient. The entrances from a main road bordering one side of the property should be adequate in view of the continual ingress and egress during the day.

JURY OF AWARD:

R. M. Hood, W. F. Lamb, J. W. Cross, P. A. Cusachs, J. O. Post, H. Greenley, J. M Howells and E. H. Denby.

NUMBER OF DRAWINGS: 44

AWARDS:

First Prize ($50.00): V. S. Swan, Cornell Univ, Ithaca.

Placed Second. (Not qualified for money prize): G. Fraser, Cornell Univ., Ithaca.

Placed Third. (Second Prize $25.00): E. L. Howard, care H. Van B. Magonigle, N. Y. C.

Placed Fourth: J. P. Morgan, Pittsburgh A. C., Pitts.

Placed Fifth: F. H. Robinson, Cornell Univ., Ithaca.

The American Specification Institute

Correspondents Continue the Discussion Favoring the Organization

All information which has been published in reference to the American Specification Institute has been read with much interest, and there is undoubtedly a great field which is to be covered by such an organization. Since the architectural schools of the country are all interested in the education of the young architect, I would like to see some provision made in your constitution whereby the schools of architecture may receive the benefit of your deliberations.

One statement in the editorial appearing November 17 states that, "In our architectural schools, in the ateliers and in the various courses given, instruction in specification writing has been neglected to such an extent that those to whom the task of specification writing has fallen have usually been forced to educate themselves." This statement is not true of the work offered at the University of Illinois, as there is a course offered to seniors in construction of specifications.

Our method of presentation of this subject to the students might be very much improved, but we are spending considerable time and making a conscientious effort to drill in the minds of the students that the writing of specifications demands very serious consideration. Our Department of Architecture would welcome any information which is prepared by the Institute, and it is hoped that it may be able to organize and carry out the work as indicated.

Having for about ten years been interested in writing specifications and interpreting architects' specifications, there is no question but that a great deal of standardization can be effected. I realize that it is impossible to write a specification which would apply to every building, but there are certain fundamental requirements which could be outlined rather completely which would be of great service to the specification writer.

As you know, there are certain standard forms already in existence, and the American Institute of Architects has its Structural Service Bureau, but the whole subject of specifications is so broad that the proposed Institute need not duplicate any of the good work which has been or is being done. With the constantly changing conditions in the way of new building materials, new methods of application, new devices, etc., for all building work, the Institute has a great work before it in keeping up on all of this latest information and distributing such information to the members or those who are entitled to receive the information from the Institute.

I teach the specification work in our department and I will welcome any standardization which the Institute finds possible to make.

A specification writer cannot be efficient and spend all or most of his time in the drafting room or office. He must be a man of practical experience and one who keeps in touch with modern methods of construction.

L. H. Provine,
Urbana, Ill. Department of Architecture,
University of Illinois.

XUM

HOUSE OF CYRIL CRIMMINS, NOROTON, CONN.

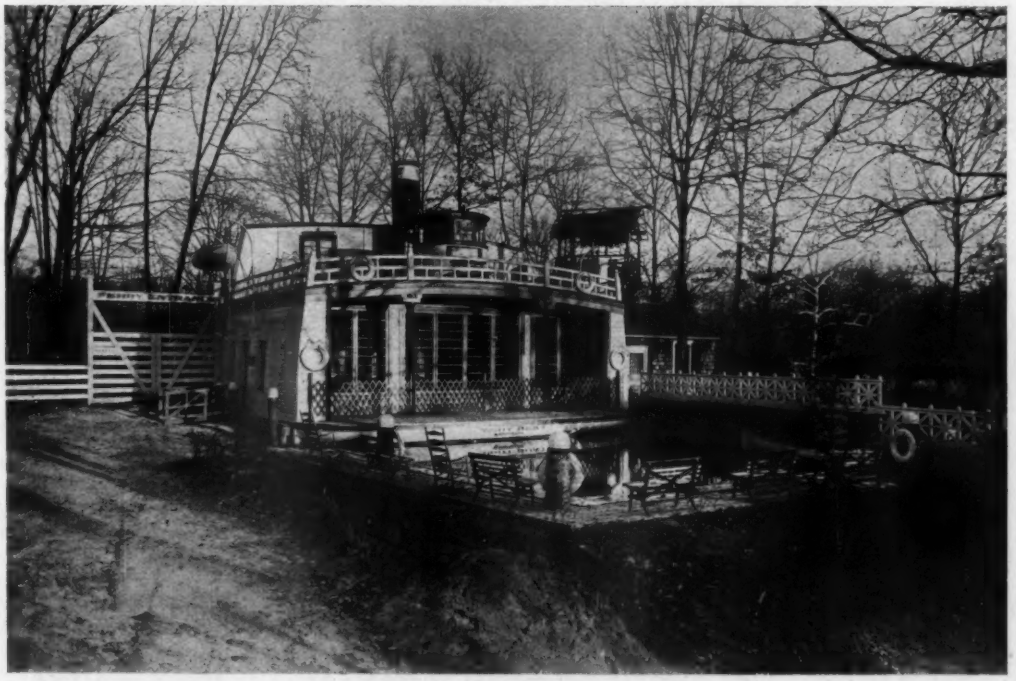
RAYMOND M. HOOD, *ARCHITECT*

By the use of the ample portico with its slender posts the architect has succeeded in transforming a rather commonplace facade into something arresting and adequate to its beautiful setting.

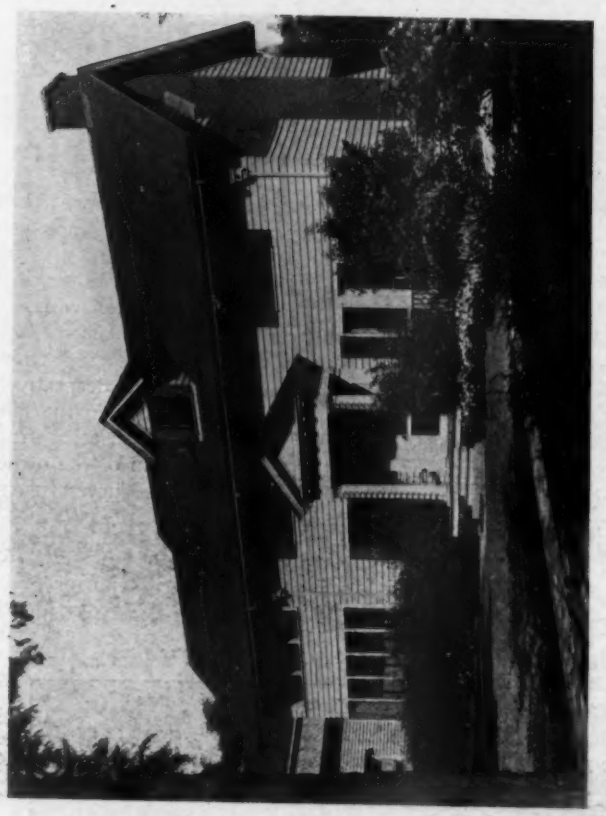
INTERIOR VIEW OF BATHING PAVILION

A House-Boat in the Woods

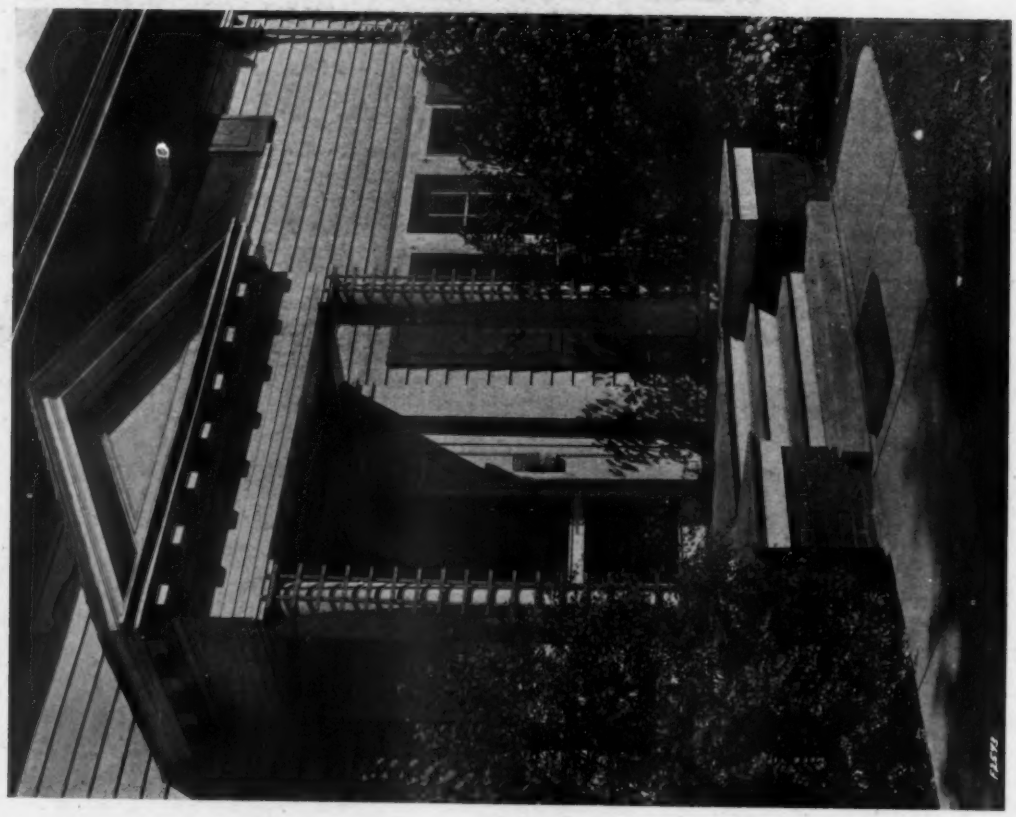
The fact that architecture is, for the most part, a serious affair does not mean that it may not have its playful expressions. Mr. Crimmins' house-boat is, in spite of its unusual design, a practical pavilion for the entertainment of his friends. The swimming pool is a highly important part of the scheme, and its location immediately adjacent to the large entertainment room is interestingly and decoratively treated. That the pavilion is designed in the likeness of a ferry-boat is an amusing variation from the usual run of things, but the whim of the owner is quite justified by the architect's successful interpretation of his conception.



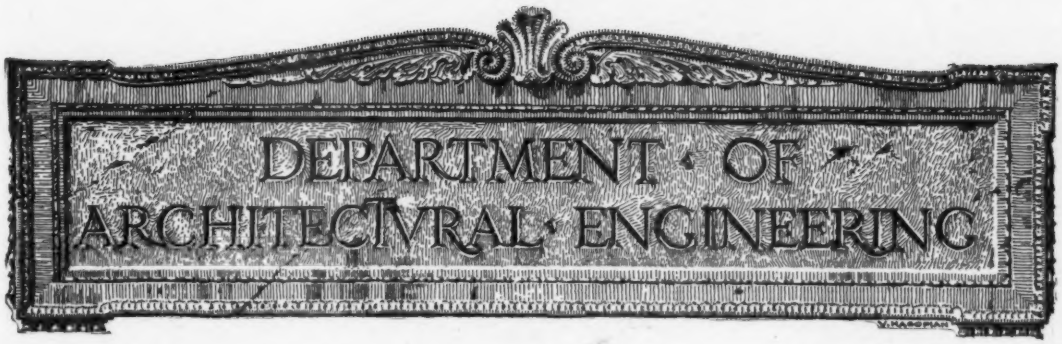
BATHING PAVILION AND SWIMMING POOL
ESTATE OF CYRIL CRIMMINS, NOROTON, CONN.
RAYMOND M. HOOD, *ARCHITECT*



HOUSE OF C. D. BARNES, KENOSHA, WIS.
N. MAX DUNNING, *ARCHITECT*



ENTRANCE DETAIL



New Design Data for Cement Slabs

Recent Information Obtained from Tests at Lehigh University on Slabs Poured with Mixture Under Pressure from a Nozzle

THE method of pouring cement slabs by shooting the mixture of sand and cement into the forms under pressure has recently developed to a point where accurate design data has been obtained for figuring the strength of such slabs.

Tests have been conducted under the personal supervision of M. O. Fuller, Adjunct Professor of Civil Engineering at Lehigh University, and George E. Strehan, Consulting Engineer, who has developed the slab formulas now accepted as standard by the Building Department of New York City. Many suggestions were received from experts who witnessed the breaking of the slabs and the results have been submitted to and approved by them.

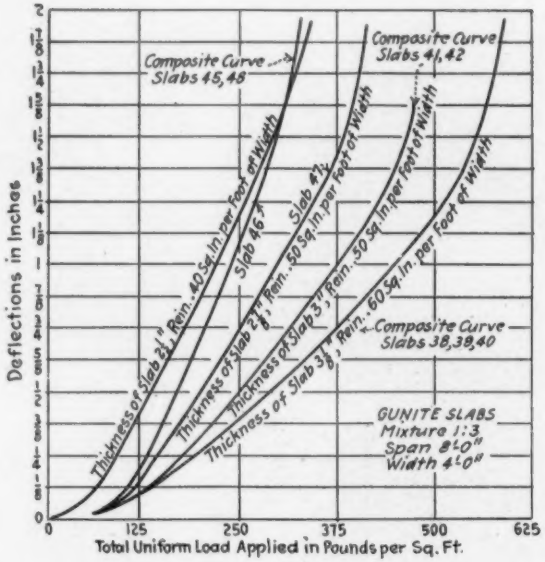
One feature of these tests was that the same conditions controlled the manufacture of the specimens in the laboratory as control actual construction work in the field. It is common practice, in testing poured concrete or hand-placed mortars, to be particular in selecting, grading, proportioning and mixing the materials. Care is also exercised in protecting or "curing" concrete laboratory test specimens. The materials entering into the slabs used in these tests were such as are ordinarily met with on good construction work. The sand used was "bank sand" from Succasunna, N. J., and was pumped into cars from under water. It was given no further treatment. The cement consisted of equal parts of four standard brands. The expanded metal reinforcement used was a standard obtainable at any time in the open market. The "shooting" of the slabs was performed by several different members of the Cement

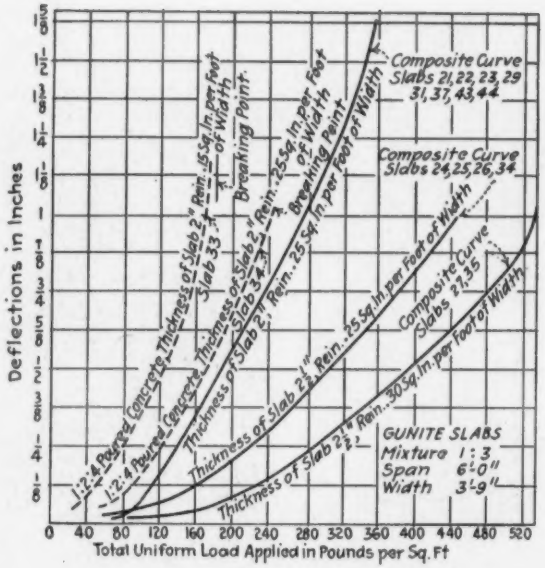
TABLE I

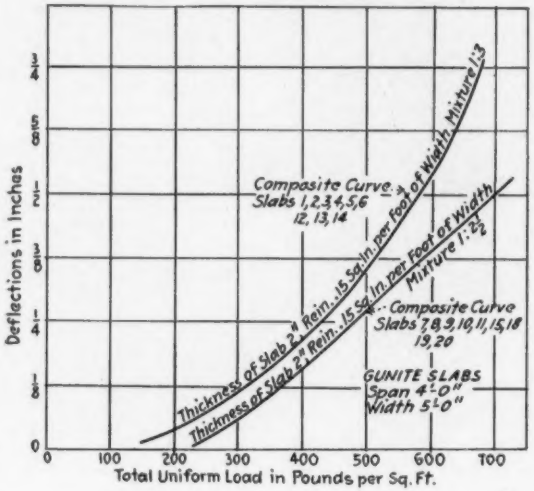
SERIES A
4′ span—5′ width n=10
1-2½ mix

Slab No.	Wt. per ft. of Width	Applied Breaking Load per ft. of width	Total Load per ft. of width	B. M.	Eff. Dept	% Steel	k	j	fs	fc
7	109	632	741	4446	1.625	.66	.303	.899	23600	1030
11	109	596	705	4230	1.625	.66	.303	.899	22500	985
18	109	715	824	4944	1.625	.66	.303	.899	26200	1150
15	110	695	805	4830	1.625	.714	.313	.896	21900	1080
19	110	745	855	5130	1.625	.714	.313	.896	23300	1150
20	110	795	905	5430	1.625	.714	.313	.896	24700	1220
8	111	875	986	5916	1.625	.904	.344	.886	23300	1220
9	111	835	946	5676	1.625	.904	.344	.886	22400	1170
10	111	692	803	4818	1.625	.904	.344	.886	19000	998
					1-3 mix					
4	109	492	601	3606	1.625	.66	.303	.899	19100	837
5	109	600	709	4254	1.625	.66	.303	.899	22600	990
6	109	609	718	4308	1.625	.66	.303	.899	22800	1000
12	110	697	807	4842	1.625	.714	.313	.896	22000	1090
13	110	580	690	4140	1.625	.714	.313	.896	18800	933
14	110	587	697	4182	1.625	.714	.313	.896	19000	943
1	111	825	936	5616	1.625	.904	.344	.886	22100	1160
2	111	686	797	4782	1.625	.904	.344	.886	18900	989
3	111	790	901	5406	1.625	.904	.344	.886	21300	1110

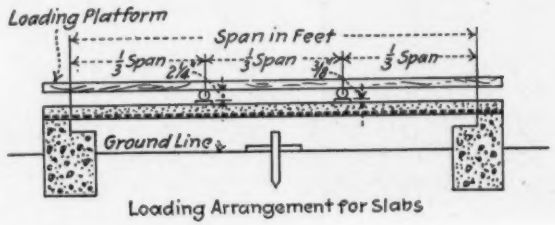
XUM


Deflections in Inches
Composite Curve Slabs 45, 48
Composite Curve Slabs 41, 42
Composite Curve Slabs 38, 39, 40
Thickness of Slab 2½" Rein. .40 Sq. In. per Foot of Width
Slab 4½"
Slab 4½"
Slab 4½"
Thickness of Slab 2½" Rein. .50 Sq. In. per Foot of Width
Thickness of Slab 3" Rein. .50 Sq. In. per Foot of Width
Thickness of Slab 3½" Rein. .60 Sq. In. per Foot of Width
GUNITE SLABS
Mixture 1:3
Span 8'-0"
Width 4'-0"
0 125 250 375 500 625
Total Uniform Load Applied in Pounds per Sq. Ft.


Deflections in Inches
Composite Curve Slabs 21, 22, 23, 29 31, 37, 43, 44
Composite Curve Slabs 24, 25, 26, 34
Composite Curve Slabs 27, 35
1:2:4 Poured Concrete Thickness of Slab 2" Rein. .15 Sq. In. per Foot of Width Slab 33 Breaking Point
Thickness of Slab 2½" Rein. .25 Sq. In. per Foot of Width Slab 34 Breaking Point
Thickness of Slab 2½" Rein. .25 Sq. In. per Foot of Width
Thickness of Slab 2½" Rein. .30 Sq. In. per Foot of Width
GUNITE SLABS
Mixture 1:3
Span 6'-0"
Width 3'-9"
0 40 80 120 160 200 240 280 320 360 400 440 480 520
Total Uniform Load Applied in Pounds per Sq. Ft


Deflections in Inches
Composite Curve Slabs 1, 2, 3, 4, 5, 6 12, 13, 14
Mixture 1:2½
Thickness of Slab 2" Rein. .15 Sq. In. per Foot of Width, Mixture 1:3
Thickness of Slab 2" Rein. .15 Sq. In. per Foot of Width
Composite Curve Slabs 7, 8, 9, 10, 11, 15, 16 19, 20
GUNITE SLABS
Span 4'-0"
Width 5'-0"
0 100 200 300 400 500 600 700
Total Uniform Load in Pounds per Sq. Ft.

These charts show the load deflection curves for the various slabs. The uniform load does not include the weight of the slab. Each curve is marked and where more than one slab number is given, the curve is the composite curve for the slabs marked on the curve.



Loading Arrangement for Slabs

Gun Company's staff of operators at different times.

The exact amount of water for proper hydration of the cement was automatically controlled. If insufficient water is used, the too dry material is blown away and lost; and if too much is used the cement will not run and will not adhere, especially on vertical or ceiling work. When cement is poured in this way there is no advantage to be gained by the nozzleman in the use of an excessive amount of water as is the case in hand placed mortars where ease in finishing is desired.

The forms consisted of two concrete blocks with a cribbing blocked up on a shelf in the blocks, a steel plate on top of the cribbing and building paper over the steel plate. Strips were laid along the steel plates at the ends to give the desired thickness.

Cement and sand were mixed dry, screened through a ⅜" square mesh and supplied to the gun hopper. The slabs were shot into the forms in one operation, the air pressure 20-22 lbs. per sq. in., and the water pressure 50-60 lbs. per sq. in.

Method of placing bars and rollers for applying loads

Two 3" x 7-16" x 5' steel plates were laid in gypsum at the third points of the span, 2¼" diameter rollers placed thereon, and then a wooden platform rested on the rollers. Pig iron was weighed and placed on the platform, the successive layers being at right angles to each other.

All slabs were loaded without interruption to complete rupture, except two which will be described further on. The slabs were loaded at 1/3 and 2/3 span by using steel bars imbedded in gypsum supporting steel rollers which in turn supported the loading platform. Pig iron was used and applied in increments of approximately 500 lbs. by hand in order to simulate ordinary handling of one-man weights in the average factory or warehouse. Deflections were read at each increment in loading. Proper care was exercised to detect the appearance of cracks; and these were closely watched during the remainder of the test.

The two exceptions above referred to were slabs Nos. 27 and 40. Slab No. 27 (3'-9" wide with span of 6 ft. and 2½ in. thick, with 11.33 per cent. of reinforcement) was loaded to 368 lbs. per sq. ft., the deflection at that time being 7/16 in. This load was left on the slab for seven days at which time the deflection had increased to nearly ⅝ in. The loading of the slab was then resumed and it broke under a load equivalent to 870 lbs. per sq. ft. The peculiarity noted was that the deflection curve on the second loading was parallel to the first loading.

Slab No. 40 (4' wide with clear span of 8 ft. 3½ in. thick, with 1.69 per cent. of reinforcement) was loaded May 8, 1920 (when 29 days old) to 440 lbs. per sq. ft. This was practically the yield point of the steel. Microscopic cracks appeared at the center and under both rollers. An examination of this slab after 185 days showed the deflection had increased to 2 1/16 in.; that the cracks had not increased; and, that no further cracks had appeared. The effective depth of this slab was 2½ in.

Reinforcement and Supporting Panel in place between concrete supports

Platform on top of rollers before load was applied

These slabs were built and tested as simple beams. In calculating slab values the ratio of the moduli of elasticity was taken as 10, based upon the report of the Joint Committee for values of concrete of over 4,000 lbs. compressive strength, and these tests definitely showed that a mixture of one part Portland cement to three parts sand applied in this way in slabs can be assumed to have a factor of safety of 4 when stressed to 1,500 lbs. per sq. in. A 1:2½ mixture has a factor of safety of 4 when stressed to 1,800 lbs. Actually, these factors of safety are 4.16 and 4.85 respectively.

Translated into floor thickness, these values show extremely interesting facts. For instance, such floors may be constructed of only one-half the thickness of concrete floors, to support the same load. This effects great economy in labor and materials, in the construction of floors, roofs and side walls.

But this effect goes further. The reduction of dead load due to the decrease in floor weights, is transmitted to the frame and through it to the foundations, both of which may be designed for a largely reduced dead load.

This method of applying cement produces a complete roof covering, because it is impervious and requires no integral waterproofing compound or composition covering. On ordinary purlin spans, with standard roof loading, slabs 1½ to 1¾ in. thick are ample from a structural standpoint. Such a roof weighs 12 lbs. per sq. ft. and, therefore, is not excessive in weight.

The fireproof qualities of this method of pouring have been tested by the Underwriter's Laboratory for wall construction. The wall was built by setting up form panels consisting of light wooden frames covered with tar paper, so spaced that a recess of 6 in. was left between adjacent panels. In this recess were set up two reinforcing rods tied together, to which the reinforcing mesh was fastened on both sides of the panel. These forms were 8 in. between side faces, and over each side was shot 2 in. of cement and sand. This created a cellular wall consisting of two 2-in. outer walls and an 8-in. air space between them with 6" x 8" columns spaced on about 7 ft. centers. The specifications of the Fire Test Committee of the American Society of Testing Materials provide that a full fire load shall consist of a heat of 900 deg. in 5 min., rising to 1,600 deg. in one hour and finally reaching nearly 2,100 deg. at 4 hrs. and that the face of the wall away from the flames

TABLE II

SERIES B
Mix 1:3 Span 6 ft.; width, 3 ft. 9 in.

Slab No.	Wt. per ft. of Width	Applied Breaking Load per ft. of width	Total Load per ft. of width	B. M.	Eff. Dept	% Steel	k	j	fs	fc
30	184	519	703	6327	1.875	.618	.295	.902	26900	1120
29	184	428	612	5508	1.625	.714	.313	.896	28200	1400
36	162	385	547	4923	1.4375	.805	.328	.891	27600	1360
26	206	750	956	8594	1.875	1.11	.373	.876	20800	1250
24	206	700	906	8154	1.9375	1.14	.377	.875	19100	1190
25	206	696	902	8118	1.6875	1.24	.389	.871	22000	1400
34	207	765	972	8748	1.8125	1.28	.394	.869	19800	1300
27	207	1306	1513	13617	1.75	1.33	.400	.867	32000	2140
35	207	864	1071	9639	1.75	1.33	.400	.867	22600	1510
43	173	592	765	6885	1.6875	1.38	.405	.865	16900	1150
44	165	577	742	6678	1.5625	1.49	.417	.861	17700	1270
22	164	455	619	5571	1.375	1.52	.420	.860	18800	1370
37	165	595	760	6840	1.500	1.55	.423	.859	19000	1390
21	164	510	674	7036	1.25	1.67	.435	.855	26300	2030
23	164	447	641	5769	1.25	1.67	.435	.855	21500	1650
31	164	493	657	5913	1.3125	1.78	.445	.852	18900	1510

Notes on Series B—
Slab No. 27 was loaded to 6211 lbs. (368 lbs. per sq. ft.) when 29 days old the deflection at this time being 7-16". The above load was then left on the slab for seven days at which time the deflection had increased to nearly ⅝". The loading of the slab was then resumed, it breaking under a load of 14770 lbs. (870 lbs. per sq. ft.).

TABLE III

SERIES C
Mix 1:3 Span, 8 ft.; width, 4 ft.

Slab No.	Wt. per ft. of Width	Applied Breaking Load per ft. of width	Total Load per ft. of width	B. M.	Eff. Dept	% Steel	k	j	fs	fc
48	287	840	1127	13500	2.125	1.50	.418	.861	26800	1920
45	275	778	1053	12600	2.00	1.59	.427	.858	19200	1430
39	347	1212	1559	18700	2.625	1.00	.428	.858	15800	1240
46	287	697	984	11800	1.9375	1.64	.432	.856	18700	1420
42	332	1069	1401	16800	2.25	1.65	.433	.856	19600	1500
47	316	894	1210	14500	2.25	1.65	.433	.856	16900	1300
38	347	1231	1578	18900	2.50	1.69	.436	.855	16300	1350
40	347				2.50	1.69	.436	.855		
41	332	984	1316	15800	2.00	1.85	.451	.850	25000	2050

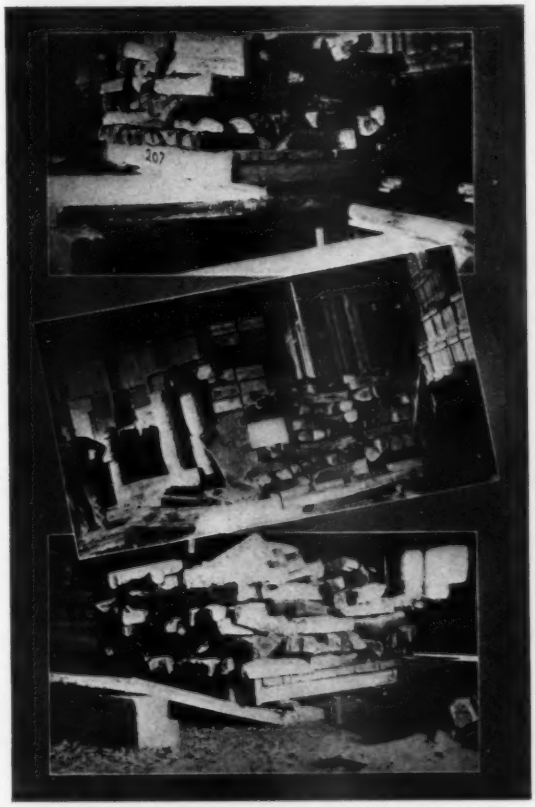
Notes on Series C—
Slab No. 40 was loaded to 10686 lbs. (440 lbs. per sq. ft.) when 29 days old, the deflection at this time being 29/32". The above load was then left on the slab for future examination.
Under this load 10686 lbs. the equivalent uniform load is 14200 lbs. Cracks had appeared at the center and under both rollers.
July 17, 1920—Examined slab today, after it had been loaded 70 days, found no increase in cracks, and deflection to be 1¾". This evidently indicated a gradual stretching of the steel as it was loaded to practically the yield point of the steel.

shall not show more than 300 deg. at the highest heat. This panel withstood all these specifications.

The official report states:

"This fire test shows that this type of 'Gunite' wall construction will furnish a substantial barrier to the passage of average severe flames for a period in excess of four hours. This wall will also furnish sufficient insulation to prevent ignition of ordinary combustible materials stored in contact with one side, when the other side is subjected to the severity of interior fires.

"The impact tests showed that this wall is not likely to be injured to the extent of allowing passage of flames, when it is subjected to the impacts of the falling timbers of one-story buildings, after the wall has been subjected to severe fire load for more than four hours."



METHODS OF LOADING

Deflections were read at increments of about 500 lbs.

The Canadian Engineer, in an editorial, November 18, 1920, states:

"An interesting by-product of the investigation" (the Slab Tests) "is the additional light thrown on the value of the modulus of elasticity. There appears to be no doubt that the value of the modulus should be taken as at least 3,000,000 for Gunite, and consequently in the preparation of the tables the ratio of the modulus of elasticity of steel to that of Gunite was taken as 10. The comparative stiffness of slabs of the material under test afford convincing evidence of the soundness of this assumption."

This type of construction and method of application offer good opportunities for economy in labor, material and time in the building construction field and the tests referred to in this article have supplied data with which it is possible to design such construction with more assurance than heretofore.

Tables I, II and III give the values of k, j, f_s, and f_c, computed by the formulas given on page 277 of Concrete Engineers' Handbook, by Hool & Johnson; first edition, 1918. In accordance with a recent decision of the Joint Committee, the value of 10 for n was used.

The maximum applied breaking load having been reduced to equivalent uniform load, it was then divided by a factor of safety of 4, to which was added the weight of the slab based upon 160 lbs. per cu. ft. as the weight of gunite. The bending moment (B.M.) was then computed by the Formula $\frac{1}{8}$ WL.

In working with the above referred-to load of one-fourth the total breaking load it will be seen that in the very much under reinforced slabs the developed values of f_c and f_s are very much below the definitely established ratings of either gunite or steel, and in those slabs where there was a high percentage of steel the actual developed values of both the gunite and the steel were in accord with a rating of about 1500 for a working value of gunite and about 20,000 for a working value of the steel.

These tables show that failure of the reinforcement occurred in all slabs of 4′ span and all of the 6′ span slabs except two, while a composite failure of reinforcement and gunites occurred in the 8′ span slabs. The latter would indicate that the critical point in both steel and gunite had been reached with a reinforcement of .40 sq. in. per foot of width for a 2½″ slab on 8′ span and .45 and .50 sq. in. per foot of width for a 3″ slab on 8′ span.

We Are Glad to Correct an Error

WE don't know just how it got by us, but it did, and it was a bad one. In fact, we are in much the same predicament as the engineer who said, when he saw his bridge floating downstream: "By George, I *thought* that decimal point was in the wrong place."

Our attention has been called to the fact that in the second paragraph of page 158, the February 9 issue of THE AMERICAN ARCHITECT stated that "it is good engineering practice to design flues so that there will be 35 sq. ft. in the cross section for every *rated* boiler horsepower."

We wish to say that this should have read: "for every 1000 *rated* boiler horsepower. Meanwhile we hope that no architect has been racking his brain trying to find room enough in the building for a flue based upon the error.

XUM

Safety in a Modern Theater*

Provisions Made for Public Safety in the Design of the Capitol Theater, Hartford, Conn.

THE moving picture, either alone or in connection with a vaudeville performance, has long been recognized as one of the leading sources of entertainment in this country. Buildings containing theaters devoted to activities of this kind house millions of people every day, and the havoc that can be wrought when something goes wrong in them is all too well illustrated by any of the several theater catastrophes that have occurred in the past few years.

In most of our cities and large towns, laws and ordinances are provided to regulate the construction of theaters and amusement halls, so as to insure the safety of the patrons of these establishments. Safety for the public should be the first consideration of every theater owner and manager, and owners and managers should not be satisfied with simply complying with the law, but should go far beyond this, and consider every reasonable means of providing comfort and security for their audiences.

INTERIOR OF THEATER
Showing cross aisle with side exits

There are no doubt many amusement houses that embody the most improved equipment and methods of construction, but as an example of one of the newest of this type we have selected the Capitol Theater recently opened by Mr. S. Z. Poli in Hartford, Connecticut. This theater is constructed and equipped along safety lines, and some of its special features may be of interest.

The theater under consideration is a large one, having a seating capacity of thirty-five hundred; and the seats are about equally distributed between the main floor and a balcony. The building is of fireproof construction throughout; the walls are of brick supported by steel frames, and the floors and roof are of steel and concrete. The balcony, which is also made of concrete reinforced steel, is supported by cantilever trusses.

All steps, stairs, and ramps are built with standard gradients, and step lights are provided on the stairs and also along the sides of the ramps, in order to avoid accidents due to darkness.

The stage portion of the theater is separated from the auditorium by a fire wall, and the stage floor is constructed of concrete, ten inches thick, over which maple flooring is laid. All the dressing rooms are of fireproof construction, and with the exception of the chairs, the furniture used in them is made of steel. Smoking is absolutely prohibited on the stage and in the dressing rooms, but a specially-constructed and presumably safe smoking room is provided for persons using these portions of the building.

In planning the theater, careful attention was paid to ventilation. In the auditorium, a suspended ceiling provides an air space extending over the entire main portion of the theater. The changes of air in the building are effected by means of a fan about ten feet in diameter, which draws in fresh air from the outside through a large duct in the roof, and forces it through ducts to vents in the walls about the auditorium. In addition to this, exhaust fans situated on either side over the proscenium arch remove the vitiated air. In cold weather, the air supplied to the auditorium is heated by means of steam coils situated in the air chamber, where the incoming air must pass over them before being distributed. Separate ex-

*Reprinted from The Travelers Standard, February, 1921.

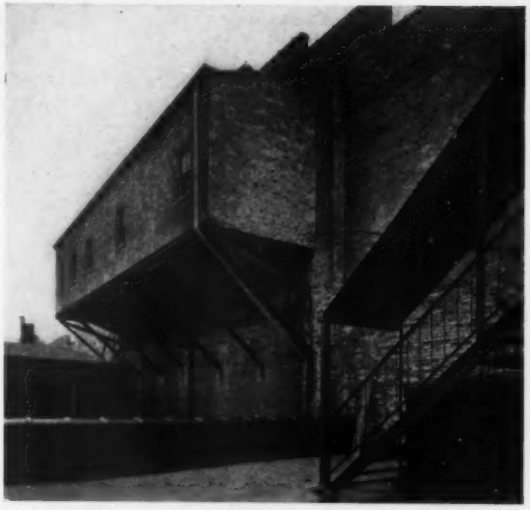
haust fans provide adequate ventilation in the toilet rooms,—efficiency in this respect being promoted by drawing some of the air out through the toilet fixtures, as well as through registers of the usual form.

The power for the electric illumination system is provided by two separate street mains, either of which has a capacity sufficient to supply current for the entire installation. The lights over the exits are so connected that they will not be affected by trouble on any of the other circuits in the house, and in case both of the power sources should fail at the same time, the lights over all the exits can be supplied with electricity from a battery of dry cells located in the theater building. It is stated that this battery of dry cells is capable of maintaining all the exit lights for a period of six hours.

In case of fire or other emergency in a theater of any kind, it is extremely important to have exits adequate in capacity and well located, so that the audience can leave the building with the least possible confusion and delay. Every floor (including all balconies and galleries) should have an exit capacity such that the combined width of all the available doors and passageways will be at least one foot for every twenty seats on that floor. Furthermore, it is preferable to have the exits from the balconies and galleries lead directly through the exterior walls of the building, and to have every exit from these elevated parts of the building provided with a separate and independent stairway. This may not always be possible, on account of the limitations imposed by surrounding buildings; but in designing a theater these principles should be borne in mind, and they should be applied as fully as the surroundings will permit.

In the case of the theater that we are describing,

EXITS AT THE REAR OF THE AUDITORIUM



ROOM CONTAINING MOTION PICTURE MACHINES

This room is entirely external to the main building

special attention has been paid to these matters, and numerous well-designed exits provide adequate means for emptying the building in case an emergency should arise. There are forty-five doors, in fact, leading outward from the auditorium, balcony, lobby, and stage. Each of these exits is clearly designated by lights, and all the exit passages are kept lighted during every performance.

On the main floor in the back part of the auditorium, there are five series of exits with three doors in each series. On each side of the main floor five doors open outward (either into an open court or into an alleyway), and in addition to these there are stairways, one on each side, affording a means of exit through a passageway under the stage.

In the balcony, in addition to two stairways to the main floor, three large exits are provided which lead to an open court and thence through enclosed fire escapes to the ground. In the lobby, four exit doors are provided in addition to the doors of the main entrance.

All the exit doors can be opened readily from the inside, because they are provided with depression panels of the latest type, which automatically unlock the doors when a slight pressure is exerted upon them. The outside doors of the building are all equipped on their inner faces with "panic bars," which are operated by merely pushing against them.

An ample number of fire extinguishers is provided in the auditorium, as well as on the stage and in the rooms under the stage. In addition to this means of protection against fire, stand-pipes and fire hose are provided on the stage and in the hall under the stage.

LIBRARY
DETROIT EDISON CO.
MAR 16 1921

XUM

There is an automatic sprinkler system in the rear of the proscenium wall, both above and below the stage, and also in the boiler-room, dressing rooms, and picture booth. The fire curtain on the stage is equipped with a lock-catch type emergency device. The skylight over the stage is composed of glass panels held in place by light ropes provided with fusible link connections. If a fire should break out, these links would melt quickly and the glass panels would then slide down upon the roof of the building, leaving the skylight entirely open. This would allow the flames, smoke, and heat to pass out through the roof, and would tend to prevent the fire from spreading to other parts of the building.

The sprinkler system is connected to the city water mains, and it is also provided with connections, outside the building, for attaching hose from the city fire apparatus. In addition, an elevated water tank of large capacity is provided, to furnish an adequate supply of stored water in case of temporary failure of the city supply. In cold weather this tank is heated, internally, so that there will be no danger of the water supply failing on account of freezing.

The moving-picture booth is probably the most unique feature of all in this theater. It is situated back of the balcony, and is entirely outside of the main building wall, being supported by heavy steel brackets and trusses. It communicates with the auditorium only by means of openings in the main wall,—openings consisting in the necessary doorways to admit the operator, and in small apertures through which the pictures are projected. Steel doors, and shutters held open by fusible links, are provided for these openings, and the roof of the booth is equipped with ample ventilating pipes. In case of fire, the booth is automatically and effectively isolated from the rest of the theater. The chairs, tables, and other furniture used in the booth are made of steel, and the generators and other electrical apparatus used in connection with the motion-picture projectors are situated in a separate room, by themselves.

For the convenience of women patrons, the management has provided a rest room, equipped with a first-aid cabinet containing the usual surgical supplies and also spirits of ammonia, smelling salts, and other emergency remedies. The room is in charge of a matron who is proficient in emergency-treatment methods.

The management of the theater conducts an ushers' school, which meets frequently to discuss problems arising in connection with serving the patrons. Each usher is taught what he or she is to do in case of fire or other emergency. Suggestions for improving the service are solicited, and the recommendations that are made by the ushers receive careful consideration from the management.

The Estrangement Between Engineers and Architects

That an unfortunate estrangement exists between engineers and architects that is detrimental to the accomplishments of both professions is apparent to one who observes the relations existing between the professions. Writing in the *Engineering World*, the editor states that engineers are inclined to criticize architects for not being practical, whereas architects are inclined to criticize engineers for not being artistic. Engineers prefer to execute their work without the advice of architects; architects, likewise, prefer to execute their commissions by themselves. Both groups, whether motivated by jealousy of personal attainment or by a sense of paternalism for the respective professions fail to recognize the fact that they have many interests common to each other, that very few development problems are exclusively engineering or exclusively architectural.

The reason for the estrangement is not difficult to uncover. It lies squarely in the training which the embryonic architects and engineers receive. In schools in which both engineering and architectural courses are provided, students are encouraged by their associations from the day on which they enter the professional schools, if not to be exclusive in their relations, at least not to be democratic in them. In schools in which only the one kind or the other of the courses is provided, the encouragement exists because of the absence of the one course or the other. The fact that the encouragement is or may be unintentional on the part of those who arrange the courses of study does not alter the consequences.

Amicable relations alone, however, between engineers and architects are incapable of relieving the state of industrial confusion and inelegance that exists. This state of affairs can be relieved only when the architect knows more of the fundamental principles of engineering—more analytical mechanics—and when the engineer knows more of the fundamental principles of design; when the architect thinks in terms of quantity as well as in terms of quality, and the engineer thinks conversely. The most endurable and most beautiful structures of all history were built when the school of architecture and of engineering was one institution. The least endurable and least beautiful structures of all time have been built since the schools of architecture and of engineering have been separated. The duty of the technical schools is obvious. Let them teach engineers more architecture and architects more engineering and a more economical, more substantial, more healthful and more beautiful industrial age will occur. Moreover the estrangement existing between engineers and architects will vanish.

Saving by Zoning

Throughout the country, the interest in zoning—chiefly as a stabilizer of land values—is growing at a rapid rate. George B. Ford, in a recent communication speaks of more than a hundred communities that are on the point of starting proceedings for zoning ordinances. He mentions two instances as illustrating the economy of zoning:

"In New York city the increased taxes based on the benefits arising from the zoning law have already paid the cost of drafting the ordinance and maps several times over. Millions are being saved in transit extension because now at last the engineers know exactly the kind and amount of development possible in each section of the city.

"St. Louis claims it would have saved two and a half million dollars in the extension of its sewer system had the zoning been in force earlier. Water system extension, paving programs, even fire protection and school programs in New York, St. Louis and Newark are showing marked savings, thanks to a definite plan of growth for the city."

Mr. Ford and his partner, E. P. Goodrich, have come to the conclusion that zoning can, to great advantage, be simplified from the ten to nineteen different kinds of districts usually adopted to perhaps six types of coterminous districts. In their plan for East Orange, N. J., they found it possible to make certain zoning districts coterminous with fire limits under the building code and to cover everything that has to do with building, formerly contained in seven or eight different ordinances, in two, the building code and the zoning ordinance.

Ethics for the Contractor

To the engineer who, in the construction industry, has arrogated to himself the only professional status, it will come as a shock or as a cause for incredulous smiles to hear of the contractors discussing a code of ethics, says *Engineering News-Record*. Yet they are discussing one; they are doing it seriously and honestly, and not as a camouflage measure. They go so far as to put contracting into a professional class. They conceive of themselves as service organizations accepting obligations toward a client.

This attitude, too, has a solid foundation. They are not manufacturers merely putting before a prospective purchaser a finished product which he can examine and test, and determine, with the article in hand, whether it is worth the demanded price. No, they are manufacturers employed, or as their own language would have it, "retained," to produce in the future a certain structure. Documents attempt to tell what that structure is to be; many precautions are taken to assure delivery of an article conforming to the documentary descriptions, but despite documents and drawings and contract articles what the purchaser ultimately gets depends in large measure upon factors not definable, upon the "skill, integrity, and responsibility" of the contractor. Is it far fetched, then, to consider that the contractor has accepted a responsibility akin to the professional? We think not.

General appreciation by contractors of the character of that responsibility and serious acceptance generally of a professional code are not soon to be expected. There will be many lapses. There must be much educational work. But the attitude of engineers toward the contractors' new endeavors must be that of encouragement. It will be easy to poke fun and to cite the rascal who was caught skimping cement in the last sewer job. Such an attitude never helped anyone to higher levels.

The contractors, it is true, must prove the sincerity of their endeavors, but the number of sterling contractors who are putting their shoulders to the wheel to realize these aims warrants the faith and confidence, and the assistance, of the engineering profession.

How We Look from Above

Photographs taken from the air by aerial travelers show the ugly spots on the beautiful landscape made by man's artificialties. Houses resemble confetti scattered on a green rug; fields look like a crazy-patch quilt. Roads and paths are puzzles for Sherlock Holmes to solve.

Contrasted with these views, however, are many truly beautiful estates whose design ornaments the general landscape in a pleasing fashion.

The new angle of view affords opportunities for the future landscape architect. Cities of the future can be planned from the air; indeed, this method is already being used in planning the suburbs of some of our large cities.

The Origin of the Corinthian Capital

It chanced one day in the fifth century B. C., that Callimachus, a famous Corinthian architect, passed by a maiden's tomb and noticed thereon a tile over which an acanthus plant had spread its foliage.

Pleased with the beauty of the leafy contour, he copied it, and upon erecting columns at Corinth shortly after, capped them with his newly discovered design. Thus, according to tradition, was the Corinthian capital conceived.

Adorning classic friezes, vases and bronzes, traced upon the works of gold and silver smithcraft, the acanthus leaf has lived through the succeeding ages—it is "the leaf that never died."

XUM

Plan to Pipe Coal

It is suggested by Reginald P. Bolton, consulting engineer, to move coal from Scranton, Pa., to New York City through two 14-inch underground pipes by water pressure. The distance is 130 miles. Scranton is 2,000 feet higher than New York, thus giving a natural pressure which it is thought will carry the mixture of coal and water at the rate of seven feet a second. He estimates that the two pipes would carry seven million tons of coal a year.

Good-Bye to Little Red Schoolhouse

West Virginia Substitutes Good Roads and Motor Buses

Though less apparent than the fattening effect on the farmers' purses, the service of the "good-roads" program to the farmers' children of several counties in West Virginia is no less real. Prior to the building of the splendid concrete highways which these localities now boast, the boys and girls commonly made their way on foot or horseback to dozens of little one-room district schools. Now they are whisked in automobiles to a few centralized, consolidated institutions, administered like the best city schools. The busses operate on schedule, and on every day of the school year, rain or shine.

Stage Settings from Blocks

A novel but very effective stage setting first used in the production of French plays in New York city, based entirely on a system of angles, is described in *Popular Science*. When the stage director for the French Players in New York is ready to plan a scene, he goes to his drawing-board and draws a diagram of the stage. Then he takes pieces of dark-colored paper, cut in the form of squares, and fits them on the diagram until he obtains the effect he seeks. The little squares of paper are all cut according to scale, each square representing so many feet on the stage. After the stage setting is all worked out on the drawing-board, the director is ready to set the stage for rehearsal.

Once the preliminary work was done in the studio, it was only a matter of a few minutes to set the stage. Back of the stage are piled numbers of square blocks and several other blocks in the shape of steps. Two of these steplike blocks, fitted together, make one large block about four times the size of the plain square blocks. Beside these curious-looking blocks stand lattices, doors, and windows. At the back and at the sides of the stage are permanent wooden pillars. The lattices, doors, and windows were so made that they fitted between these pillars. They are all made in such a way that they are interchangeable. It is not necessary to have two sets of scenery, yet, when the stage is set, the scenes presented have an entirely different appearance.

This type of scenery lends itself to the production of both outdoor and indoor scenes. Almost any arrangement of a simple or formal garden can be accomplished with the blocks and lattices, while out of the combination of the interchangeable doors, windows, and blocks can arise a room suitable for a peasant's hut or a king's palace.

Memorial Competition

The Barre Quarriers Assn., of Barre, Vt., representing the donors of a $10,000 prize fund have inaugurated a competition for the purpose of obtaining a suitable design for a Soldiers and Sailors Monument to be erected upon the public park at Barre, Vt., at a cost of $60,000.

The donors have prepared a program governing the competition which has the approval of the committee on competition of the Boston Society of Architects, A. I. A. and have appointed as Advisor, Mr. W. A. Murray, 59 Washington St., Barre, Vt., to whom all communications shall be addressed, and from whom a copy of the program may be obtained.

To initiate the program the Advisor desires to extend a public invitation to all sculptors and architects to submit evidence of their professional experience, educational and other qualifications.

Pueblo Architecture in Concrete

Woodwork Practically Eliminated in Quaint Pueblo Styles

All the quaint charms of the old pueblo style of architecture is preserved in concrete in a series of little cottages now under construction in Monrovia, Cal., says *Popular Mechanics*. The one-story buildings are most remarkable for their complete use of cement, woodwork being practically eliminated. Even the roofs are concrete, and the doors are made of magnesite. The poured walls, 5 in. thick, inclose a web of waterproofing material, while the cement floors are stained in Spanish leather effect, waxed and polished. The little structures are wholly fireproof, and easy cleaning is assured by the absence of mouldings, casings and baseboards. Inclosed courts off the kitchen and sleeping chambers, partly roofed and partly screened, provide outdoor protection and privacy.

Finns Develop Own Architecture

Architecture Develops with Increase of Material Wealth

For years Finland possessed no architecture of its own. Finnish architectural students not only sought their training abroad, but were forced to remain

abroad for a livelihood. Stone was a luxury which few could afford. Only the public buildings were of stone. The wood-built towns were so frequently swept by fire that all desire for architectural beauty was destroyed. German and Italian architecture prevailed, and though great art upheavals swept other countries, Finland remained untouched.

Then came an increase of material wealth and with the increase Finland began to develop a few building ideas of its own. Today there are structures of granite and stone, and though German influence is still strong, the Finns have adopted a plainness and simplicity of style characteristic of themselves. Finnish architecture has a wealth of proportion and massiveness, with a lavishness of original ornament. Though simplicity usually prevails, sometimes a freakish shape is given to towers, spires and corners.

On all sides, from the buildings housing the headquarters of the American Red Cross and those in which more than 10,000 Russian refugees have been cared for to the buildings in the pretty Helsingfors Boulevardsgatam, may be seen the beginning of Finnish architecture. Granite and stone, together with bricks covered with plaster, produce beautiful and fantastic ornamentation.

The Versatile Cocoanut Palm

In the islands of the Southern Seas, the cocoanut palm supplies all of the needs of the members of society. It supplies the natives with lumber to build their homes, their boats, and their utensils.

When the leaves of the tree are young, they are eaten. When they are old, they are woven into hats, clothes, baskets, bedding, paper, and thatch. The ribs of the older leaves are made into spears, arrows, brooms, torches, and paddles.

The flowers of the tree give the natives wine, vinegar, and sugar. The fruit of the palm yields oil, foods, cord, and matting.

It is said that even the roots are sometimes used as food.

To Beautify Basements

Throughout the country there seems to be a general movement tending to beautify the cellar. This campaign, it is declared by those most interested, was not born of prohibition, but by a feeling that the basement may be made as cheerful and inviting as any of the rooms overhead.

Concerns dealing in heating apparatus are featuring the plan in all or at least most of their advertising matter. The cellar, so long the storage place for ashes and all kinds of debris, is now pictured as a neat, almost luxurious room. It is portrayed with all the spotless appearance and general comfort of a living room.

To bring about such a condition many suggestions have been advanced by the advertisers. In the first place it is set down that the heating apparatus must shake off its drab dress and assume one of brightness. The boiler casing should be polished and symmetrical, and the nickel trimmings kept free from dust. Other suggestions are tile floors, enameled walls and coal bins constructed of stained wood.

Some of the larger heating concerns are bending every effort to make the movement widespread. Already it has met with considerable favor, and gives every indication of growing in popularity.

Landmarks for the Aviator

Standard arrangement of landing-fields would be an advantage to the itinerant airman who flies at night and who comes down in a strange region, declares *Popular Science*. For instance, if the pilot knows where the radio tower is placed with relation to the airdrome, he would know at once how to avoid a possible crash in approaching the field in thick weather. Vertical and portable searchlights illuminating the field are indispensable.

Directing an airplane by wireless, the so-called "radio localizers" on the modern landing-field should bear a definite relation to the position of the airdrome. A plan suggested by the United States Air Service furnishes an ideal arrangement of these details. On one side of the airdrome is placed the meteorological and radio equipment structures, which project upward and obstruct a clear approach to the field. On the other side of the airdome are the localizers and the fog-dissipation mechanism built underground, and the markers. Here nothing projects into the air to hinder low flying when looking for the landing-place.

Bungalow on Factory Roof

A piano factory in Cincinnati has the distinction of possessing a bungalow on the roof of its new factory. A complete bungalow of English design and a beautiful garden, with hedges, walks, flowers and trees has been provided. The entire construction is an architectural novelty for it will not rest on the roof of the factory. Reinforced concrete columns will be brought through the factory roof. The foundation for the garden and bungalow will be built on I-beam supports resting on these columns. The bungalow is to be used as a meeting place for officers and directors of the company; but the plans show a structure of exceptionally homelike possibilities. There is an immense living room, with a big open fireplace. There is a kitchen, an enclosed dining

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porch, bathrooms with tub and shower baths, and a big stone terrace leading to the garden. There is to be a lawn with a number of walks, several of them beach pebble paths, and one a plank walk "country style." A red tile roof, of sweeping slope, will converge with the tile edge of the factory roof at the south end of the building. The bungalow will face toward the north.

Book Notes

"A Book of Ceilings." By George Richardson. London: 1776. Reprinted and published by Wm. Helburn, Inc., New York. $12.50.

An excellent book dealing with plaster ceiling design is George Richardson's "A Book of Ceilings," reprinted by William Helburn, New York. This work was originally published in London in 1776, and the present reprint is a faithful reproduction. Previous to its publication Richardson was associated with the brothers Adam and it is claimed that many of the so-called Adam ceilings were actually conceived by Richardson. The book consists of forty-eight plates, showing line drawings of the ceiling designs and forms a very complete exposition of the Adam style.

The 1921, 29th edition of Hendrick's Commercial Register, is published. Several new features have been added in the way of indexing. The book is published by S. E. Hendricks' Company, Inc., N. Y., and furnishes a directory of manufacturers in different industries.

Personals

A. D. Taylor, landscape architect and town planner, has moved to 405 Cook Building, 4614 Prospect avenue, Cleveland, Ohio.

John J. Wilkens, architect formerly of Kyle & Wilkens, architects of Charleston, W. Va., is now located at 402 Durner Building, Peebles Corner, Cincinnati, O., and desires manufacturers' catalogues and samples.

Mr. M. Hamdy, Bey El Kattan, State Buildings Department, West Division, Alexandria, Egypt, is desirous of receiving catalogs and other literature regarding American products suitable for use in constructing schools, hospitals, prisons, tribunals, post and telegraph offices, railway stations and bridges, houses and buildings of all kinds.

John P. Kingston & Son, architects, suffered large damages in the recent Worcester fire and have now reopened offices at 220 Park Bldg. Full supplies of manufacturers' samples and catalogues are desired.

P. S. Clark has opened an office at 703 Krise Bldg., Lynchburg, Va. Catalogues and samples are desired.

Kanzor Bros., architects, Dollar Savings & Trust Bldg., N. S., Pittsburg, Pa., announce that this is their correct address and not Renshaw Bldg. where mail is frequently addressed to them.

Wilbur Herby, architect, has opened an office at 202 Bonner street, Dayton, O. Mr. Herby was formerly practicing with his brother under the name of Chas. Herby Sons, in the U. B. Bldg., Dayton.

Murphy, McGill and Hamlin, architects, formerly Dana & Murphy, are now located at 331 Madison avenue, New York City. Richard H. Dana, formerly connected with the firm, is now practicing alone.

Percy D. Bentley, formerly of the firm of Merman & Bently, LaCrosse, Wis., has opened an office for the practice of architecture at 505 Exchange Bank Bldg., St. Paul, Minn., and desires catalogs and samples.

Frederick A. Strauel, architect, has opened an office for the practice of his profession at 125 Northwestern National Life Insurance Bldg., Minneapolis, Minn. The Minneapolis office of Purcell & Almslie, architects, is in charge of Mr. Strauel and he will continue to look after their interests in that section. Other offices are located in Chicago and Portland, Ore.

C. E. Shepard, architect, announces the removal of his offices to 509-11 Reliance Bldg., Kansas City, Mo.

Clinton Paine Greer, architect, has recently opened an office at 2209 Roslyn avenue, Baltimore, Md., and desires catalogs and samples.

Weekly Review of the Construction Field

With Reports of Special Correspondents in Regional Centers

What About Industrial Building?

A Few Facts on Industrial Building Prospects for 1921, Based Upon a Recent Survey Made by The American Architect

The American Architect has recently made a careful survey of the building programs of several important industries. The indications given below were gathered from authoritative sources, and show briefly what may be expected in these various businesses and industries.

There is every evidence of a large increase in bank building. The banks are all prosperous, most of them are outgrowing their present quarters, and they have found out that the building of new structures always leads to an increases in business. The Gotham National Bank Building in New York is one among several important new banking structures which are now being erected throughout the country.

A great world market for American textiles, and the very possible reduction in the cost of living and therefore of wages, will carry forward the contemplated extension of mills in New England. There will be development of new mills in the south, close to the raw goods market. The silk field will not provide very much building, as this will consist, for the most part, of "small stuff," but there is likelihood of considerable "small stuff."

There will be considerable extension of paper mills, and these will be of the very highest type of construction. The greatest extension will be in Canada, but there will also be building in the south, where advantages will be made of the so-called "jack pine," and where there is also the likelihood of a development of paper-making from cotton hulls and linters.

The first endeavor of the railroads will be to improve their rolling stock and rights of way. Bridges will be their first structural undertaking. In this field there is need of extension to round houses, freight shops, car shops and railway terminals. Some of this work will be undertaken in 1921.

There will probably be no great extension in steel mills, foundries or buildings of machine tool manufacturers during the coming year. The endeavor in this field will be to increase production by means of increased individual human efficiency and increased output on mechanical operations.

Orders are now placed in the electrical industry for an 8 per cent. increase in generating capacity over the existing capacity, and this increase in generating capacity will require about 10 per cent. increase in floor space. About half of this increase of floor space will come from extension of existing plants. In Hydro Electric development, little is looked for in the immediate future, but a 90,000 horsepower development is now going forward in the south, and the Ford development at Troy, New York, is going ahead.

They Have Always Gone Up

Wages in the Building Trades for the Past 700 Years Show Steady, Determined Upward Trend—William Hardy's Research Shows Increase from Year 1250

The only way to judge the future is by the past, said Patrick Henry, and on that basis there is to be a continuation of wages at present or higher levels.

For the last 700 years, ancient records of the history of the building trades in London show a constant upward trend. With the exception of the downward curve for a short period in the Thirteenth Century, the scale has invariably been a rising one. William Hardy, who conducted the research, sums up his conclusion as follows:

"Once again history has repeated itself, and the lesson taught by these investigations is undoubtedly that wages when they have once risen never fall. Is it not time, therefore, that we adjust our accounts to the new standard? It is false optimism to believe that the near future will show us a return of old conditions. History shows that only by stabilizing the controlling factor—wages—is it possible to fix the price of commodities. When an increase has been sanctioned it must be realized that such increase has brough us to another rung in the ladder of wages of which the lower rungs have been forever destroyed."

He thus gives the pay to laborers, the penny being calculated at two cents:

Year	Wages Per Day	Year	Wages Per Day
1250.....	.03½	1650.....	.28
1300.....	.05	1700.....	.40
1350.....	.06	1750.....	.40
1400.....	.06	1800.....	.58
1450.....	.08	1850.....	.72
1500.....	.08	1914.....	$1.60
1550.....	.10	1920.....	5.00
1600.....	.16		

These statistics reflect conditions in England. But the general trend in America has not been dissimilar, and the same deductions may be applied to the labor situation here.

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(*Special Correspondence to* THE AMERICAN ARCHITECT)

CHICAGO.—There is much ground for optimism in the building report just issued by Building Commissioner Bostrom for the month of February. It shows that 311 permits were issued as compared with only 166 issued in January of this year and 276 issued in February, 1920. The February permits are classified as follows: apartments, 41; residences, 181; factories, 75, and miscellaneous buildings, 14. There is a particularly big jump in the matter of apartments, last month having shown 41 permits as compared with only 13 issued in January and 12 in February of 1920. As far as valuation is concerned, February permits have the ascendancy, also. The value of the proposed buildings is estimated at $15,366,000 as compared with an estimated valuation of only $4,119,000 for the month of January.

Experts are inclined to feel that the improved situation as indicated by the growing number of permits is the beginning of an important resumption of activity in building in Chicago, although there is still a great deal of discussion and hesitation regarding building projects.

Some very important construction is being held in abeyance until a settling of labor and material costs permits the "go ahead" signal to be given with a greater feeling of rock-bottom security. In this list should be included the Fair department's store building for men, the new bank and office building of the State Bank of Chicago, the new building for the Illinois Trust group of banks. Permits have been issued for these buildings and plans are drawn up. The only thing that is delaying the early beginning of construction is the feeling on the part of bank directors and building authorities engaged in the construction that things have not yet reached the rock bottom and the building is likely to be held up until the readjustment period has been completed.

Progress has been made in the preparations for the Illinois-Merchants Trust Company building which is to be located on LaSalle street, immediately opposite the Federal Reserve Bank building, which is already in process of construction. The bank has even gone so far as to purchase some of its marble, steel and other materials. Steel is already being received and stored, while the marble is enroute from Italian quarries and should be here within a few months at the outside. The marble was obtained at a very low rate, it is announced, because the bank was able to take advantage of the exchange situation.

This building will be almost a counterpart of the Federal Reserve Bank which it will face across LaSalle street. It will be twenty-one stories high and will take full advantage of the city's building limit of 260 feet above the sidewalk level.

The Federal Reserve Bank contract has been awarded to John Griffith & Sons, the contract price being $7,500,000. The Illinois-Merchants Bank will cost in the neighborhood of the same amount.

Chief activity continues to center, however, in small residential buildings in suburban properties. The number of permits is indicative of this, although much of the suburban activity would not register in the city's building permit reports.

An important conference of the week has been a session of the National Federation of Construction Industries. This body gathered at the Hotel Sherman in response to a call from the Philadelphia Chamber of Commerce. The meeting has taken the trend outlined at a recent conference of building industry leaders which convened in Chicago at the suggestion of the National Lumber Manufacturers Association. Ernest T. Trigg, chairman of the industrial relations committee of the Philadelphia Chamber of Commerce, who presided at the conference, sounded the keynote of the meeting when he emphasized the importance of getting all phases of the building industry down to rock bottom, as far as price is concerned, in order to win and hold public confidence.

"The public is on strike," said Mr. Trigg, "and we must put prices down to where they will warrant investors getting back into the field. Labor costs must be adjusted, not entirely by a quick reduction of wages but by greater efficiency.

"Material prices are not down to the average of other commodities. To get the confidence of the people and investors we must get down to normal."

Other speakers echoed the sentiments of Mr. Trigg, among them Daniel Crawford, Jr., a prominent builder of Philadelphia, who criticised banking interests for their lack of liberality in considering building loans—which the conference regards as one of the important obstacles in the path of building all over the country.

"The best risk that a banker can take," said Mr. Crawford, "is to lend money to the man who wants to buy or build a home for himself. If the man's stability of character is first investigated, no better loan can be made. Banks are not nearly liberal enough, and if they do not become disposed to loan more willingly they might as well quit loaning altogether, because their unwillingness is prohibitive to most prospective home owners."

Mr. Crawford indicated that 80 per cent. of the value of property is not too high a proportion for a loan.

The banker's point of view was expressed by Harry A. Wheeler, vice-president of the Union Trust Company of Chicago. He explained that the present re-discount rates are the real obstacles in the way of cheaper money for building.

"If re-discount rates were lowered today," said Mr. Wheeler, "current money rates would fall within forty-eight hours. From our viewpoint, that is the biggest item now obstructing financing of building projects. If the Federal Reserve system will lower its rediscount rate in conformity with the rate now prevalent in a number of commodities the banks will immediately lower their interest rates on money."

As the time for the "Own Your Home" Exposition draws nearer, the feeling is more general that this show will provide a very powerful stimulus for home building. All phases of the building industry are to be represented at the Exposition which is to be held at the Chicago Coliseum March 26-April 2. Henry K. Holsman is chairman of the architectural division, and an exhibit of more than ordinary interest is now being prepared.

Another exhibit in which architects are interested is to be held at the Art Institute from March 8 to April 5. The exhibit will be a combined display of architecture, landscape design and applied arts, and will, in the hope of the architects, bring about a closer co-ordination of all the arts related to building. Among the participating organizations are the Illinois Chapter of the American Institute of Architects, the Illinois Society of Architects and the Chicago Architectural Club. John A. Holabird, a well-known Chicago architect, is chairman of the exhibition committee.

In the building materials field the past week has shown very slight changes in prices. Practically all lumber items remain the same, with no demand to speak for any of the grades or varieties of lumber. In the building supplies list there have been some minor revisions affecting cement and lime.

The general prices are about as follows:

Yellow Pine: B. & B. 1-in., $95 to $130, depending on thickness; 2 x 4, No. 1, 10 to 16 ft. length, $51 to $53; 2 x 6, $48; 2 x 8, $50; 2 x 10, $53; 2 x 12, $55; 13-16 x 3¼ z & b flat flooring, $85 to $90; 1 x 6, No. 2 common, $48 to $90. *Douglas Fir:* 2 4 S, in sizes up to 12 x 12, in length up to 32 ft., $65 to $70; 14 x 14, $68 to $73; 16 x 16, $72 to $75; 18 x 18, $75 to $80. *Hard Maple:* Four, ¼ No. 1 and 2, $135; select, $120; No. 1 common, $100; No. 2 common, $65; No. 3 common, $32. *Birch:* Four ¼ No. 1 and 2, $160; select, $133 to $138; No. 1 common, $95 to $100; No. 2 common, $60 to $65; No. 3 common, $40. *Red Gum:* Four ¼ No. 1 and 2, $150; No. 1 common, $90 to $92; No. 2 common, $45.

Face Brick—Standard, vitrified red, $32.00@34.00; Smooth, Indiana red, $38.00@40; Smooth, Ohio red, $38.00@40.00; Smooth, Pennsylvania red, $46.00@48.00; Smooth, buff, $45.00@47.00; Smooth, gray, $47.00@49.00; Rough, buff, $44.00@46.00; Rough, gray, $47.00@49.00; Variegated, rough texture, $34.00@49.00.

Common brick, $13.00 to $16.00 per M. Portland cement, $2.25 per bbl. Torpedo—Lake and bank sand, $3.50 per yd. Crushed stone, gravel screenings, $3.50 per yd. Hydrated lime, Ohio, paper, $21.00 per ton. Hydrated lime, Ohio, cloth, $29.00 per ton. (Includes sacks at 30c each.) Hydrated lime, Wis. paper, $19.00 per ton. Bulk lime, $1.65 per ton.

(*Special Correspondence to* THE AMERICAN ARCHITECT)

SEATTLE—Due to competitive conditions on the Pacific coast which have no present connection with the mill basis, sheet metals and bars used in building construction have been lower, with Portland houses taking the initiative in the decline just at the time when building investors were ready to start figuring for their season's work.

Seattle jobbers deplored the cut inasmuch as it effectually stopped all building projects that had to do in any degree with sheet metal. The task of educating builders to feel that steel prices had reached bottom has been carried on with much success by jobbers, architects and contractors to the end that vitally needed construction be gotten under way and the materials put on the job. About all the constructive results that have been taken from the unsettlement was to hold up pending work. It seems certain that it has not moved any more materials, as local jobbers report a reactionary tendency.

Stocks of cement, plaster, roofing and brick are now plentiful at all large coast jobbing centers. Jobbers are unable to understand why brick, which is manufactured here in quantity and in all grades, is holding firm. The market shows no signs of weakening.

Competition among roofing jobbers is keen, and all are eagerly out for business. Bids were opened by the Alaska Engineering Commission this week for an order approximating $200 for the government railway in Alaska. Seventeen bids were submitted, and while there were a few duplications from San Francisco, Portland and Seattle bidders, seventeen houses were represented. Bids ran from $1.59 per square to $4.90 per double roll. In no event was it possible to take a greater profit than $20 gross on the contract, and several of the bidders offered bids on a basis of $12 gross. The order was only 20 per cent. of that given last season. The zeal and number of bidders for so small a contract convinced local jobbers that the patent roofing houses are in a fair way to over-supply their product, and are being closely followed up with competition from red cedar shingles.

Robert D. Kohn, architect of New York, on the

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coast on a business trip, is advocating the co-operative apartment house plan. He favors it because of its convenience for those who travel considerably as a home that can be left at will without the assistance of caretakers.

Harlan Bartholomew, of St. Louis, was called to Seattle by real estate and building interests in behalf of the proposed zoning system.

Despite the heavy overstocks of fir lumber at the mills such assortments as finish, vertical grain flooring and ceiling are running short. Prices have remained stationary excepting in short dimension. Enquiries from eastern buyers vary from day to day and in different selling agencies. Some mills and wholesalers report an increase, while others give it as the sense of eastern buyers that book accounts are not liquidating as speedily as hoped. Fifty members of the Retail Lumbermen's Association of New York who have been in the West Coast fir territory for a week express themselves as satisfied that fir lumber will be in brisk demand next Spring despite the high transcontinental freight rates, and orders were placed by these retailers for several hundred thousand feet.

About 55 per cent. of the fir mills are in operation. Wholesalers are covering up and closing as fast as possible. It is desired to have a clean slate before the middle of March. While these operators are not willing to predict more than a stiffening of the Spring market, there is an undertone of strength.

Conferences at Chicago between West Coast lumber manufacturers and officials of the transcontinental line railways in March relative to lower freight rates are expected to bring definite reductions. The transcontinental lines are getting no eastbound tonnage, and are desirous of getting the business. Low water rates already established have caused some anxiety to the overland carriers. This rate from Puget Sound to New York is $20 per 1,000 feet, or $11 and more under the all-rail rate.

The New York lumbermen booked their orders to go by water.

Unemployment Cannot Stop Saving

Savings Banks Accounts in Third Federal Reserve District (Philadelphia) Increase—80,000 Out of Work in Philadelphia—Resumption of Building Would Relieve This Condition

The current business review of the Third Federal Reserve District states that unemployment figures, as reported by the Pennsylvania State Department of Labor, show 80,000 out of work in Philadelphia and about 65,000 in other leading cities of this district. Negotiations for resumption of building will, if successful, greatly reduce these figures, the bank reports.

Savings bank accounts in all parts of the district increased in January. Debits to individual accounts as reported by member banks of thirteen Clearing Houses show declines of $45,000,000 for the month and almost the same for the year.

In a chart of the general business situation, the Federal Reserve Bank of Philadelphia shows the situation in brick, iron and steel, lumber and plumbing supplies to be as follows:

Business	Demand	Prices	Raw Material Situation
Brick	Limited	Downward	Improved
Iron and steel	Very poor	Downward	Plentiful
Lumber	Limited	Downward	Ample
Plumbing supplies	Limited	Downward	Improved

The whole table shows conclusively that the general business situation has decidedly improved for the industries of Philadelphia and other cities of the Third Federal Reserve District.

MONUMENTS OF DOGES SILVESTRO AND VALIER, AND DOGARESSA VALIER,
IN CHURCH OF SANTI GIOVANNI E PAOLO, VENICE

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